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HANDBOOK

OF

MATERIA MEDICA, PHARMACY, AND THERAPEUTICS.

POTTER.

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5481

A HANDBOOK

OF

MATERIA MEDICA, PHARMACY AND THERAPEUTICS

INCLUDING THE

PHYSIOLOGICAL ACTION OF DRUGS, THE SPECIAL THERAPEUTICS OF DISEASE, OFFICIAL AND PRACTICAL PHARMACY, AND MINUTE DIRECTIONS FOR PRESCRIPTION WRITING:

BY

SAM'L O. L. POTTER, A.M., M.D., M.R.C.P. Lond.,

FORMERLY PROFESSOR OF THE PRINCIPLES AND PRACTICE OF MEDICINE IN THE COOPER MEDICAL COLLEGE OF SAN FRANCISCO; AUTHOR OF THE "QUIZ-COMPENDS OF ANATOMY AND MATERIA MEDICA," "AN INDEX OF COMPARATIVE THERAPEUTICS," SEVERAL ARTICLES IN FOSTER'S "PRACTICAL THERAPEUTICS," AND "SPEECH AND ITS DEFECTS"; MAJOR AND SURGEON OF VOLUNTEERS, U. S. ARMY.

Ninth Edition, Revised and Enlarged.

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1902.

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TO MY WIFE

WHOSE DEVOTED CARE AND
PATIENT ENCOURAGEMENT,
DURING THE PAST TWENTY-THREE YEARS,
HAVE SUPPORTED THE AUTHOR
IN EVERY EXIGENCY OF
HIS PROFESSIONAL LIFE.

95133

PREFACE TO THE NINTH EDITION.

The revision for the eighth edition of this book was commenced at Manila, Philippine Islands, while the author was serving as Attending Surgeon at the Headquarters of the Department of the Pacific and Eighth Army Corps. The present edition contains material gathered from the writer's experience in active professional practice in a tropical climate, among soldiers and civilians, men, women, and children, during a period of over three years' duration.

In the section on Materia Medica thirteen articles were rewritten and forty new articles were inserted. The rewritten ones are those on Adrenal Extract, Argentum, Cinchona, Coca, Coffea, Digitalis, Dulcin, Ergot, Ferrum, Ipecacuanha, Myrrha, Saccharinum and Veratrum Viride. The new matter includes paragraphs on Actol, Airol, Argentamin, Argentol, Argonin, Chinosol, Creosotal, Dionine, Dormiol, Equinine, Eucaine, Eudoxin, Glycerophosphates, Heroine, Holocaine, Iodomuth, Iodothyrin, Itrol, Largin, Nirvanin, Nosophen, Orphol, Orthoform, Passiflora, Pellotine, Peronine, Phloridzin, Piperidin Protargol, Tuberculin-R, Urotropin, Xeroform and Zinc Stearate.

In the section on Therapeutics new articles were inserted on Local Anesthesia, Beriberi, Dhobie Itch, Tropical Fevers, Heat-stroke, Hemoglobinuric Fever, Lymphadenoma, Miliaria, Bubonic Plague, Sprue, Tinea Imbricata, Tinea Versicolor and Toxemia. Thirty-two articles in this portion of the book were rewritten, including those on Amenorrhea, Asthma, Boils, Cholera, Diabetes, Dysentery, Dyspnea, Eczema, Gonorrhea, Gout, Insomnia, Leprosy, Leucocythemia, Lichen, Myxedema, Pemphigus, Phthisis, Pneumonia, Remittent Fever, Typhoid Fever, Septicemia, Shock, Suppuration, Ulcers, Uremia, Urinary Disorders, Variola and Wounds. The text of many other articles has been expanded by the incorporation of more than three hundred items from current medical literature and from the author's personal experience in practice. The articles on Poisoning, on Temperature in Disease, and on the Clinical Examination of the Urine have been transferred to this part of the book from the Appendix, in the belief that they will be more frequently consulted when found in their alphabetical order in the section on Therapeutics.

The text throughout the book has again been subjected to a thorough and critical revision, has been largely rewritten, and has been expanded by the introduction of much new matter. The latter has to some extent taken the place of material considered obsolete or comparatively unimportant, so that the increased size of the book over the seventh edition is only twenty pages.

The favor with which this book has been received during the last fourteen years by medical teachers, students and practitioners is very gratifying to the author, and will stimulate him to renewed effort to the end that his work may continue to maintain its position in professional esteem and confidence.

SAMUEL O. L. POTTER.

MANILA, PHILIPPINE ISLANDS.

EXTRACTS FROM THE PREFACE TO THE FIRST EDITION.

The author's intention has been to produce a book which would embrace in a single volume the Essentials of practical Materia Medica and Therapeutics, treating of each subject in as concise phraseology as possible consistent with the delineation of every important feature. He has also endeavored to formulate such minute and definite directions for the framing of Prescriptions as might elucidate what to many is a very difficult problem. Furthermore, he has tried to present as much information upon the subject of Pharmacy as every physician should possess, in order to handle the implements of his profession with confidence and to direct their use by others with pharmaceutical accuracy.

The complete fulfilment of these aims would be realized if the book should take rank as a working companion to the advanced student and the junior practitioner, and be deemed by them a reliable guide through the forest of observations and experiments on drug actions and uses, which make progress slow for the already over-burdened mind, when ploughing through the more exhaustive and exhausting text-books.

Although this book is essentially a compilation, as all books of its class must be, there will be found in its pages much original matter derived from the writer's own experience in professional life. The arrangement of the matter will be found to be in some respects unique. After full consideration of the many arrangements of the Materia Medica in vogue, a modified alphabetical plan was adopted, by which the advantages of the alphabetical order might be retained, while permitting the grouping together of agents which are closely related, physiologically and therapeutically, under the title of the principal member of the class—the chief, as it were, of that particular clan. Thus, under the title AMYL NITRIS will be found mention also of the Ethyl, Sodium and Potassium Nitrites, and their congener Nitro-Glycerin, all of which are closely allied to the first-named and to each other, in respect of their actions and uses. A very elaborate section on Drug Classification is placed before the Materia Medica, in order to supplement such deficiencies in grouping as are inevitable in an alphabetical arrangement.

In detailing the characteristics of an important drug, its physical properties and chemical constituents are first briefly enumerated, then its preparations are described in the official language of the pharmacopœia, usually somewhat abbreviated; any important unofficial preparations are also noted, and all the compounds into which it enters are enumerated. Next the physiological action is taken up, its characteristic features being first described; then the actions resulting from an ordinary medicinal dose, next those produced by small doses continued, and finally those from a toxic dose. These are followed by a brief account of its antagonists, antidotes and incompatibles, if any, and a concise summary of its therapeutical applications closes the article;—the whole presenting, it is hoped, a clearly defined word-picture of the drug under consideration. Every article and preparation comprised in the last edition of the U. S. Pharmacopœia is fully noticed, while all the prominent unofficial agents receive such mention as their respective importance seems to demand.

The second part of the book is devoted to Pharmacy, and has been written from the standpoint of a conviction that many young practitioners would gladly dispense their own medicines, if provided with a few practical directions on the subject; thereby saving many a dollar from the drug store, preventing in their own practices at least the "renewals" which constitute so bad a feature of modern pharmaceutics, and gaining for themselves a practical acquaintance with their professional weapons which cannot but make them better physicians and more accurate prescribers. In this section of the book Prescription Writing receives full consideration, and many standard formulæ are given as samples of prescriptions of each kind in extemporaneous use.

In the third part the subject of Special Therapeutics is treated of elaborately, in the form of an alphabetically arranged Index to the treatment of diseases, as laid down by the most recent authorities. Every indication for the use of a drug is referred to its author by his name or initial, and to the most prominent articles are appended a few selected formulæ, to serve as guides to the neophyte in prescribing.

Nearly all the regular text-books have been laid under contribution in the preparation of the book, but especial use has been made of the works of Brunton, Ringer, Wood, Phillips, Waring and Bartholow, in their latest editions; as well as of the writer's *verbatim* notes of two courses of didactic and clinical lectures delivered by Professors Da Costa and Bartholow in the Jefferson Medical College and Hospital and in the auditorium of the Pennsylvania Hospital. On page 603 will be found a list of the authorities referred to by initials in the section on Special Therapeutics.

The Appendix contains numerous Tables, comprising diagnostic hints, Latin terms and phrases, formulæ for hypodermic use, metric equivalents, and specific gravities and volumes; also Formulæ representing the most noted patent medicines.

The Index has received special attention, from a conviction that, if well made, it is the best part of a good book. Every title, synonym and other reference of importance is included therein, double and treble entries being made in every instance which seemed to require such repetition.

The term "officinal," as applied to drugs recognized by the pharmacopœia, has been discarded, the word "official" being used instead; for the simple reason that the idea to be conveyed is expressed more correctly by the latter term than by the former one. When none but official drugs and preparations were kept in the *officina* or drug store, it was eminently proper to call them "officinal," but inasmuch as this class does not nowadays constitute much over one-fourth part of the officinal stock, it is a wilful debasement of our professional weapons, as well as an inexcusable misnomer, to apply the shop-title to them any longer.

COOPER MEDICAL COLLEGE, SAN FRANCISCO,
DECEMBER, 1886.

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EXPLANATION.

Numerals unqualified, under the subtitles *Preparations* in Part I, denote grammes for solids and cubic centimeters for liquids.

For Signs and Abbreviations used, see pages 533 to 545.

INTRODUCTION.

Drugs (*drugan,* to dry),—is a term which was formerly applied to dried medicinal plants, and is still employed by writers and others in that sense. By extension, however, it has been made to cover all material substances used for the treatment of disease, including remedial agents from the animal and mineral kingdoms as well as those belonging to the vegetable kingdom.

Pharmacology (*φάρμακον*, a drug, *λόγος*, a discourse),—is the science which treats of drugs and therefore properly embraces in its scope all of materia medica and therapeutics relating to drugs. By some writers this term is employed in a more restricted sense, including only the physiological action of drugs, a subject which is more correctly designated by the word *Pharmacodynamics* (see below).

Pharmacy is the name of the art which supplements the science of pharmacology, namely—the art of preparing drugs according to the requirements of the pharmacologist and of dispensing them on the prescriptions of the therapeutist. It includes a thorough knowledge of the materia medica, an acquaintance with the theories and manipulations of chemistry and an intimate practical experience in many operations peculiar to itself.

Materia Medica is the branch of Pharmacology which treats of the substances used as medicines and describes their origin, composition, physical characteristics, chemical properties, modes of preparation and administration, also their physiological and toxicological actions. Two of its divisions are—

Pharmacodynamics (*φάρμακον*, a drug, *δύναμις*, power), which means the discussion of the physiological action of drugs, their modifying power upon the normal physiological activity of the human organism.

Toxicology (*τοξικόν*, a poison, *λόγος*, a discourse), describes the effects of drugs administered in poisonous doses, and treats of the antagonists and antidotes by which their effects may be neutralized or the poisons themselves rendered innocuous and removed from the organism.

Therapeutics (*θεραπεύειν*, to attend upon), comprises all the science and art of healing, and includes the use of medicines and all other agents and measures which are known to alleviate or cure disease. The operations of Nature herself are properly embraced in the general term Therapeutics, which may be subdivided as follows:—

Natural Therapeutics, includes the operations of the *Vis Medicatrix Naturæ*, the healing power of Nature,—those modes and processes of healing which occur independently of art and tend to the spontaneous decline and cure of disease. There is no scientific dogma better established than this, that *the living organism is in itself adequate to the cure of all its curable disorders*. This natural law sustains the medical skeptic in his infidelity as to the value of medicines, enables the homeopathist to report his sugar-cures, and helps all physicians out of more close places in practice than they are generally willing to acknowledge. This part of the subject is taught only casually in the schools, in connection with pathology and the other subjects embraced in the chair of Principles and Practice of Medicine, but it deserves a special chair and more systematic treatment than it receives.

Applied Therapeutics embraces the application by Art of agents foreign to the living organism, for the purpose of aiding Nature to restore the body to a healthy condition. This division is the portion of the subject which is taught separately and systematically in the schools, and therefore is alone considered in the following pages.

Other divisions of the general subject employed in professional literature and conversation are those entitled *Empirical Therapeutics* and *Rational Therapeutics*.

Empirical Therapeutics is a term applied to the use of medicinal or other therapeutical agents for the sole reason that they have been tried previously with successful results in cases apparently identical with the one under treatment. By those who advocate this method it is styled the Therapeutics of Experience, and is claimed to be an accumulation of means of combating disease simply by observation and experiment independently of physio-pathological reasoning (Hartshorne). It was necessarily the original method in therapeutics, has conferred many rich gifts upon medical science, and has been advocated by many great physicians, its latest and ablest expounder being the eminent and lamented Niemeyer.

The use of Opium to relieve pain, of Cinchona for malarial fevers, of Colchicum in gout, of Potassium Iodide in syphilis, of the Bromides in epilepsy, and of Cod-liver Oil in phthisis, are examples of the empirical use of remedies. But, after all has been said for it that can be said, the fact remains that it is essentially an unscientific method, a mere elaboration of the prevailing popular habit of recommending Mrs. A. to use pepper tea, because it cured Mrs. B. of "the very same trouble." Permitted to reign supreme, it would be destructive to all exactness in therapeutical progress. The so-called "experience" of one observer is too often overbalanced by the experience of another equally competent and trustworthy; and as few are encouraged to record their failures with remedies, there can be no scientific comparison of the failures with the reported successes. For this reason empirical methods would tend to a minimum degree of accuracy in a science which, in the very nature of things, can never be an exact one;—though undoubtedly such methods will always prevail to some extent.

Rational Therapeutics means the use of remedies for reasons based on a knowledge of the pathological conditions present in the subject and the physiological action of the agent employed. This method is the very antithesis of empiricism, and has been the leading idea in every revolt against empirical therapeutics in the past. Humoralism, Chemicism, Solidism, Stimulism, Galenism in the 2d century, Paracelcism in the 16th, and Hahnemannism in the 19th, all originated in efforts to find a more rational system of administering medicines than the prevailing empiricism of the day.

The illustrious Albrecht von Haller, the father of Physiology and the author of the doctrine of Irritability, was the real originator of modern physiological therapeutics. In the preface to his Swiss Pharmacopœia (*circa* A.D. 1755), occur the following remarkable directions,—the first recorded of their kind:—

> "Nempe primùm in corpore *sano* medela tentanda est, sine peregrina ulla miscella; odoreque et sapore ejus exploratis, exigua illius dosis ingerenda et ad omnes quæ inde contingunt affectiones, quis pulsus, quis calor, quæ respiratio, quænam excretiones attendendum. Indè adductum phænominorum in sano obviorum, transeas ad experimenta in corpore ægroto."

> "*In the first place the remedy is to be tried on the healthy body, without any foreign substance mixed with it; having been examined as to its odor and taste, a small dose is to be taken, and the attention directed to all effects which thereupon occur; such as upon the pulse, the temperature, the respiration, the excretions. Having thereby adduced their obvious phenomena in health, you may pass on to experiment upon the sick body.*"

Forty or more years after these rules were laid down *éx cathedra* by Haller, the central idea therein was incorporated as one of the main pillars into a medical edifice then being erected in Germany. In the course of construction this pillar became so hidden beneath a superstructure of palpable absurdities, that the medical profession, in its anxiety to steer clear of the whole mass, almost forgot the corner-stone of truth appropriated from the teachings of one of its own greatest teachers. While, however, the mass of the medical profession, blinded by prejudice, turned away from everything which savored of drug-experiment, a few physicians were quietly working on the lines of Haller's dogma that *drug-proving is the only true basis of drug-using*. As a result of their labors the present generation sees the development of an idea, announced nearly 140 years ago, but now inspiring the minds of teachers and students all over the civilized world. Medical colleges are recognizing physiological drug-experimentation as a part of their regular curricula; laboratories are fitted up in many of the schools with costly instruments of precision, for the more exact prosecution of this study;

and under the direction of such men as Wood, Ringer, Murrell, Brunton, Hildebrandt, Fraser, Binz, Liebermeister, Husemann, Schmiedeberg, etc., systematic researches are being conducted upon animals to ascertain the physiological action of every agent hitherto used in medicine. The alkaloids and other active principles of vegetable drugs, together with the numerous synthetic compounds which chemistry is giving to medicine, are subjected to the same rigid experimentation. The medical press of every civilized country is filled with the results of these labors, and no medical student is permitted to pass the graduating ordeal until he has mastered the essential characteristics of the physiological action of the important medicaments so far as established. What has hitherto been the conviction of but a few, is daily growing into a fixed canon of professional belief, that physiological experimentation with drugs must be the basis of their therapeutical employment, and that all real advance towards the establishment of therapeutics as a science, must be made upon the lines laid down by Haller, namely, drug-proving upon the healthy human organism. Still, in the words of Brown-Séquard, "Therapeutics will cease to be empirical, only when this last kind of knowledge shall be fully obtained;" but its fulness will never be fully realized unless the results have been thoroughly considered with regard to the differences due to the action of drugs *in different doses* on *the human organism* in health and disease.

A thoroughly-prepared materia medica of half-a-dozen standard drugs, such as Aconite, Arsenic, Belladonna, Mercury, Opium and Quinine, based upon their actions and uses in different doses and under different states of the organism, would be of more real value to the physician who wishes to do his work accurately and with his eyes open, than all the contents of the dispensatories, plus the entire literature of the "new remedies," and every symptom in the ten quarto volumes of the largely discredited and partly repudiated homeopathic materia medica. If medical students would devote but one month of their annual college vacation to the personal investigation of some one feature of the action of some one drug, under such safe-guards against error as would secure the acceptance of the resulting observations, a mine of therapeutic gold would soon yield its solid truth to eager eyes. Formally laid down by Haller in 1755, cultivated to some extent by Alexander in 1768, Crumpe in 1793, Thommassini, Curtis, etc., urged by John Hunter, Sir Thomas Watson, Dr. King Chambers, and many other luminaries of the medical profession, the scientifically guarded proving of drugs on the human organism has lain, like the similar work of Jenner, neglected these many years, waiting for another Koch to re-inaugurate the work.

CONSTITUENTS OF ORGANIC DRUGS.

Drugs are derived from all the three kingdoms of nature. Those which belong to the mineral kingdom may be termed *inorganic drugs* and are resolved by chemical analysis directly into their ultimate principles, the elementary bodies of which they are composed. *Organic drugs* are those which are taken from the animal and vegetable kingdoms. They are to some extent composed of inorganic materials (water, gases, salts, etc.), but chiefly consist of organic compounds (proximate principles) obtained by a proximate analysis. The further reduction of these proximate principles to their elementary constituents shows that Carbon plays the leading role therein, associated with Hydrogen, Oxygen, Nitrogen and other elements. The proximate principles of vegetable drugs may be divided into insoluble and soluble groups; the first containing those which resist the action of ordinary solvents, the second including those which may be dissolved in suitable menstrua and thereby separated from those which are not soluble in a particular menstruum.

The *Insoluble Constituents* are substances which make up the cell-walls of vegetable drugs, namely—Cellulin (Cellulose), Lignin and Sclerogen. They are extremely intractable to the action of solvents and yet find places in the materia medica under various forms. Cellulin in the form of Cotton is used extensively by both the surgeon and the pharmacist, and by the action of strong acids or alkalies thereon, there is obtained Pyroxylin (Gun-cotton), which dissolved in ether makes Collodion. By the destructive distillation of cellulin and lignin a large number of solid, liquid and gaseous products are obtained, including acetic acid, methylic alcohol, phenol, creosote and tar. From their natural decomposition result amber, coal, coal-tar and the many derivatives of the latter substance. The *Soluble Constituents* include some principles which are medicinally inert and also many active principles.

The Active Principles include carbohydrates, alkaloids, glucosides, neutral principles, organic acids, resins, fixed oils and fats, waxes, volatile oils, camphors, miscellaneous principles (phenols, ketones, etc.), protein bodies (albuminoids) and ferments. Some of these are not proximate principles from the strict chemical point of view, as they are not simple bodies (*e. g.*, fixed oils, fats, waxes, and many of the volatile oils), but for the purposes of the materia medica it is convenient to so classify them. Others are active chiefly as foods, though in some cases they are employed as medicinal agents. For the methods of extracting the soluble principles from drugs see the articles entitled MACERATION and PERCOLATION, in Part II of this book.

Carbohydrates are properly regarded as foods rather than as medicines, yet many of them possess remedial qualities due to their neutral, bland, demulcent, lubricant, protective or soothing action. They include the *Amyloids*, cellulose, starch, dextrin, inulin, etc., the *Sugars*, as glucose, levulose, lactose (milk sugar), maltose (malt sugar), saccharose (cane sugar), etc., and the *Gums* and *Pectin Bodies*, as arabin, pectin, bassorin, cerasin, etc.

Gums are not proximate principles but amorphous, transparent substances which are widely disseminated in plants and yield *Mucic Acid* when treated with nitric acid. They form sticky preparations with water and are precipitated by alcohol. *Arabin* is the main constituent of soluble gums. *Bassorin*, which swells up in water, is one of the constituents of gum tragacanth, also of cherry and plum gums. [Compare the articles entitled ACACIA and TRAGACANTHA, in Part I.]

Alkaloids (*alkali*, εἶδος, resemblance)—are organic basic substances existing in many plants, usually in combination with organic acids. They readily combine with acids to form crystalline salts which are soluble in water, the alkaloids themselves being almost insoluble therein though dissolving in alcohol. They are odorless, of more or less bitter taste, and generally possess powerful physiological actions. They are easily decomposed by alkalies or alkaline carbonates, and are precipitated from their solutions by several reagents, including iodine in a solution of potassium iodide, potassio-mercuric iodide, auric chloride, also picric, tannic, phospho-molybdic and phospho-tungstic acids. Their Latin names terminate in *—ina*, their English name in *—ine*, as Morphina, *Morphine*.

Chemically the alkaloids may be regarded as derivatives of Ammonia (NH_3) or ammonias in which one or more atoms of H are replaced by various radicles. They are believed to be decomposition products of vegetable albumin occurring in the plant-cells during the process of growth. They all contain the elements of C, H and N; most of them also contain O (amides), and usually occur as crystalline solids which (except Berberine) are colorless. A few containing O occur as liquids, namely—Lobeline, Lupuline, Muscarine, Pelletierine and Pilocarpine. Some are devoid of O (amines) and occur as volatile, oily liquids, namely—Coniine, Nicotine, Piperidine, Pyridine, Sparteine and Trimethylamine. In their chemical composition the latter are closely related to *Pyridine*, C_5H_5N, an alkaloid which seems to underlie the molecular structure of many others. Some of them may be synthetically prepared from the pyridine bases (picoline, collidine, etc.). By changing the chemical constitution of an alkaloid its physiological action can be completely altered.

Alkaloids are sometimes called *organic or vegetable alkalies*, to distinguish them from the inorganic or mineral alkalies, which they resemble in little except their reaction and basic qualities. The term *artificial alkaloid* is applied to secondary alkaloids derived from natural ones, as Apomorphine. The term *synthetic alkaloid* should be restricted to those which occur in nature but have been prepared synthetically, and should never be applied to bases which are only obtained by synthesis and do not occur naturally, as Antipyrin, Thallin, etc.

Many so-called alkaloids are in reality mixtures of different alkaloids, *e. g.*, Veratrine. Some plants contain more alkaloids than one, including a second which may be similar in action to the first but weaker (as Brucine) or antagonistic in action to the principal one (as Calabarine).

The first alkaloid discovered was Morphine, isolated and described by the apothecary Sertürner in 1816. Within sixteen years after that date Strychnine, Brucine, Quinine, Cinchonine, Narcotine, Codeine, Veratrine, Coniine, Atropine, Nicotine, Aconitine and Hyoscyamine were discovered by different chemists.

Of the alkaloids 15 are official, under either their own names or those of their salts, besides Veratrine which is described as a mixture of alkaloids. Of the official salts of alkaloids there are 10 Sulphates, 6 Hydrochlorates, 3 Hydrobromates, and 1 each Bisulphate, Acetate, Salicylate and Valerianate. The official alkaloids are the following named:—

Apomorphina, *Apomorphine*,—a derivative of the alkaloid Morphine.
Atropina, *Atropine*,—from Belladonna and some allied plants.
Caffeina, *Caffeine*,—the active principle of Caffea, the coffee plant.
Cinchonina, *Cinchonine*,—a minor alkaloid from Cinchona (Peruvian Bark).
Cinchonidina, *Cinchonidine*,—another alkaloid from Cinchona.
Cocaina, *Cocaine*,—from the plant Erythroxylon Coca.
Codeina, *Codeine*,—the second in rank of the Opium alkaloids.
Hyoscina, *Hyoscine*,—one of the alkaloids of Hyoscyamus (Henbane).
Hyoscyamina, *Hyoscyamine*,—another alkaloid from Hyoscyamus.
Morphina, *Morphine*,—the principal alkaloid of Opium.
Physostigmina, *Physostigmine*,—also called *Eserine*,—from Physostigma.
Pilocarpina, *Pilocarpine*, the principal alkaloid of Pilocarpus (Jaborandi).
Quinina, *Quinine*,—the chief alkaloid of Cinchona (Peruvian Bark).
Quinidina, *Quinidine*,—a powerful but scanty ingredient of Cinchona.
Strychnina, *Strychnine*,—the principal alkaloid of Nux Vomica.
Veratrina, *Veratrine*,—a mixture of alkaloids from Asagræa officinalis.

Unofficial but Important Alkaloids are the following:—

Aconitina, *Aconitine*,—the active principle of Aconite.
Berberina, *Berberine*,—from Berberis, Hydrastis, Calumba, and other plants.
Brucina, *Brucine*,—the second alkaloid of Nux Vomica.
Colchicina, *Colchicine*,—the active principle of Colchicum.
Coniïna, *Coniïne*,—the principal alkaloid of Conium (Hemlock).
Curarina, *Curarine*,—the active ingredient of Curare (Woorara).
Duboisina, *Duboisine*,—from Duboisia; identical with Hyoscyamine.
Emetina, *Emetine*,—the alkaloid of Ipecacuanha.
Gelsemina, *Gelsemine*,—the active principle of Gelsemium.
Homatropina, *Homatropine*,—a derivative of the alkaloid Atropine.
Muscarina, *Muscarine*,—from the Fly-agaric, a poisonous mushroom.
Pelletierina, *Pelletierine*,—from Punica Granatum, Pomegranate.
Sparteina, *Sparteine*,—a volatile alkaloid obtained from Scoparius.

Allied to the alkaloids are the organic products termed *Leucomaïnes* and *Ptomaïnes*, the former being alkaloidal substances produced by the decomposition of albuminous matter in the living animal tissues during the normal destructive metamorphosis, the latter being similar substances produced by the process of putrefaction. Many of the ptomaïnes are identical with certain vegetable alkaloids.

Glucosides (*γλυκύς*, sweet),—form a group of organic principles, existing in plants and generally neutral in character. They may be resolved by boiling with dilute acids or alkalies, or by the action of ferments, into *glucoses* (chiefly dextrose) or other bodies (mannite, phloroglucin) which themselves yield glucoses, also one or more other bodies (alcohols, aldehydes, phenols, etc.) which are different in each case. Thus, Salicin, $C_{13}H_{18}O_7$, which is a glucoside, by the action of a dilute acid is split up into glucose and saligenin, according to the following reaction, $C_{13}H_{18}O_7 + H_2O = C_6H_{12}O_6$ (glucose) $+ C_7H_2O_2$ (saligenin). Under the supposition that glucose and its congeners are alcohols it is probable that glucosides are the corresponding ethers. Few of them, if any, contain N, but they all contain C, H and O. They are often the most active of the principles in the plants containing them, but they are more frequently associated with other active principles, as alkaloids, oils, resins, etc. Like other neutral principles, the glucosides have Latin names which end in *—inum*, and English names ending in *—in*. The official glucosides are two, namely—

Glycyrrhizinum, *Glycyrrhizin*,—from Liquorice-root.
Salicinum, *Salicin*,—obtained from Willow and other barks.

Unofficial but important Glucosides are those named in the following list:—

Adonidinum, *Adonidin*,—from Adonis vernalis.
Arbutinum, *Arbutin*,—from Bearberry leaves.
Cathartic Acid,—one of three glucosides in Senna leaves.
Colocynthinum, *Colocynthin*,—the active principle of Colocynth.
Convallamarinum, *Convallamarin*,—from Convallaria majalis.
Digitalin, Digitaleïn, Digitoxin and Digitonin,—the four active principles contained in Digitalis, the last-named one antagonizing the other three.
Ipecacuanhic Acid,—existing in Ipecacuanha.
Jalapinum, *Jalapin*,—the active principle of Scammony.
Saponinum, *Saponin*,—obtained from Quillaja, the Soap-bark.
Strophanthinum, *Strophanthin*,—the active principle of Strophanthus, and one of the most powerful poisons known.
Tannins, except Tannic Acid, which is an organic acid, are considered to be glucosides; the chief ones being Caffetannic Acid, Chinotannic Acid and Quercitannic Acid.

Neutral Principles,—are all neutral in character, of various composition and powers, and characterized by the absence of basic or other properties which would place them in the other groups. Many have a very bitter taste and have been therefore called *Amaroids* or *Bitter Principles*. Like the glucosides their Latin names end in *—inum*, their English names in *—in*. Those which are official are the following-named:—

Aloinum, *Aloin*,—from various species of Aloes.
Chrysarobinum, *Chrysarobin*,—a mixture of proximate principles obtained from Goa-powder.
Elaterinum, *Elaterin*,—extracted from Elaterium.
Picrotoxinum, *Picrotoxin*,—obtained from Cocculus Indicus.
Piperinum, *Piperin*,—from Black Pepper.
Santoninum, *Santonin*,—the active principle of Wormseed.

Unofficial, but important Neutral Principles are—

Anemoninum, *Anemonin*,—a camphoraceous principle from Pulsatilla.
Cantharidinum, *Cantharidin*,—the active principle of Spanish Flies.
Cotoinum, *Cotoin*,—an acrid principle in Coto Bark.
Quassinum, *Quassin*,—a bitter principle in Quassia-wood.

Besides the above-mentioned principles, there are several other substances bearing pharmacopœial names ending in *—inum* or *—in*, which have no relationship to either of the groups previously described. Among them are—

Chinoidinum, *Chinoidin*,—a mixture of alkaloids from Cinchona.
Glycerinum, *Glycerin*,—the sweet principle of fats and fixed oils.
Lupulinum, *Lupulin*,—the glandular powder of the Hop plant.

Also *Abrin*, a toxic albumose in Jequirity-seeds; *Ricin*, a poisonous ferment in Castor-oil seeds; and Antipyrin, Benzin, Chinolin, Kairin, Lactophenin, Naphtalin, Pancreatin, Pepsin, Phenacetin, Piperazin, Pyroxylin, Resorcin, Thallin and other organic compounds which are not derived from either the animal or vegetable kingdoms, but are manufactured in the chemical laboratory.

Organic Acids or Carbon-acids, contain the univalent group CO_2H (carboxyl) linked with a hydrocarbon residue. They contain no N, but have acid properties, forming salts with bases. The principal organic acids are—

Official.		*Unofficial.*	
Acetic Acid.	Oleic Acid.	Agaricic Acid.	Formic Acid.
Benzoic Acid.	Salicylic Acid.	Angelic Acid.	Malic Acid.
Citric Acid.	Stearic Acid.	Butyric Acid.	Meconic Acid.
Gallic Acid.	Tannic Acid.	Camphoric Acid.	Oxalic Acid.
Lactic Acid.	Tartaric Acid.	Cerotic Acid.	Succinic Acid.

Coloring Matters form a group of bodies having very different properties and the nature of many being not yet understood. Among them are—*Carminic Acid*, in the cochineal insect, also in some plants; *Carthamin*, from the safflower; *Chlorophyll*, in all green parts of plants; *Curcumin*, the coloring matter of turmeric; and *Hæmatoxylin*, from logwood.

Resins. The proximate principles called by this name are neither the commercial resins nor the resins of pharmacy (see under RESINÆ in Part II), all of which are complex bodies, but include only the chemical individuals of resinous character existing in nature, as those in Copaiba, Cannabis, Gamboge, Guaiac, Gurgun, etc. Even these, in their commercial form, are accompanied by other principles. It is difficult to define the resins correctly, but they are generally considered to be oxidation products of hydrocarbons, such as terpenes. They are mostly brittle, amorphous, uncrystallizable solids, insoluble in water but soluble in alcohol, ether, chloroform, benzin, etc. Most of them are of acid character, combining with alkalies to form a kind of soap, these "resin-soaps" being soluble in water and giving up their resins again to the action of acids. They soften or melt when heated and solidify again on cooling. They may be obtained from oleo-resins, as turpentine, by simple distillation, the volatile oil passing over and the resin remaining behind; or by heating the part of the plant in which they are contained, as in the case of guaiacum resin.

The substances ordinarily called Resins are usually classified as follows :—

True Resins are hard, compact products of oxidation, and are made up chiefly of n acids. Such are Copal, Damar, Mastic, Sandarach, Dragon's blood, Gum-lac and ber.

Gum-resins are natural mixtures of gum and resin. When they are rubbed up with er the gummy matter dissolves and the resin is suspended in the form of an emulsion. mpare the title EMULSA, in Part II, also the subtitle GUMS, *ante*, p. 22.] Such are banum (frankincense), Myrrh, Ammoniac, Asafetida, Galbanum and Tragacanth.

Oleo-resins include all mixtures of volatile oils and resins of whatever consistency, the Balsams or mixtures of resins with benzoic and cinnamic acids. Such are aiba, crude Turpentine, Storax, and the true balsams—Benzoin, Balsam of Peru and sam of Tolu. There are six official oleo-resins, which are described under the title ORESINÆ in Part II.

Pharmaceutical Resins are solid preparations obtained by precipitating the resinous ciples of plants from their alcoholic solutions by the agency of water. Three such parations are official in the U. S. Pharmacopœia, and are described under the title INÆ in Part II.

Fixed Oils and Fats, though usually placed among the constituents nimal and vegetable drugs, are not proximate principles, being com- und bodies containing the radicle *Glyceryl*, C_3H_5 in combination with ydrides of the various fatty acids. The decomposition of these lies by heating with water and an alkali yields the triatomic alcohol *ycerin*, $C_3H_5(OH)_3$ and one or more fatty acids (stearic, palmitic, ic, etc.). The latter combine with the alkali, forming soaps, and the ceryl is converted into glycerin, a portion of the water being consumed he reaction. [See the subtitle *Saponification* under the title SAPO, in t I.] An exception to this rule is the case of Cod-liver Oil, which s not yield glycerin when saponified but oxide of propyl. The fol- ing-named official fixed oils and fats are those which are chiefly ployed in medicine, viz.—

Adeps, *Lard*,—the abdominal fat of the hog.
Adeps Lanæ Hydrosus, *Hydrous Wool Fat*,—the purified fat of the wool of the sheep.
Sevum, *Suet*,—the abdominal fat of the sheep.
Cetaceum, *Spermaceti*,—obtained from the sperm whale.
Oleum Adipis, *Lard Oil*,—expressed from lard.
Oleum Amygdalæ, *Almond Oil*,—expressed from almonds.
Oleum Gossypii Seminis, *Cottonseed Oil*,—from cottonseed.
Oleum Lini, *Linseed Oil*,—expressed from flaxseed.
Oleum Morrhuæ, *Cod-liver Oil*,—from the liver of the cod-fish.
Oleum Olivæ, *Olive Oil*,—expressed from ripe olives.
Oleum Ricini, *Castor Oil*,—from the seed of the castor-oil plant.
Oleum Sesami, *Sesamum Oil*,—from the seed of the Bennè plant.
Oleum Theobromatis, *Oil of Theobroma*, *Cacao-butter*,—expressed from the seed of the Chocolate-tree.
Oleum Tiglii, *Croton Oil*,—expressed from the seed of Croton Tiglium, an Indian plant.

Waxes are also compound bodies, closely allied to fats but containing glyceryl, and are usually placed among the proximate principles for of convenience. The official *wax* (Cera) is prepared by the honey- Chinese insect wax is the secretion of a coccus upon a variety of ash. Japanese wax is obtained from the fruits of several varieties of Rhus. Myrtle wax is obtained from the fruits of various species of Myrica. Wax is used in pharmacy; internally it is practically inert and harmless.

Volatile or Essential Oils form a large group of organic bodies existing in plants, from which they are usually extracted by distillation with water, being volatilizable at the temperature of boiling water. They are generally liquid at ordinary temperatures, and when exposed to cold many of them separate into a solid, crystalline portion, called *stearopten*, and a liquid portion, called *elæopten*. They are highly odorous, oily, sparingly soluble in water, more or less soluble in alcohol and in ether, colorless, or yellowish, inflammable, and prone to become resinous on exposure to the air. A few consist of but a single proximate principle, for example—*Oil of Betula*, which is wholly methyl salicylate. Most of them are complex bodies, consisting of two or more principles which can be separated from each other. The list of the volatile oils is quite an extensive one, 36 being official in the U. S. Pharmacopœia and described in Part I of this book under the titles of their respective sources. The group may be subdivided into the following classes, viz.—

Hydrocarbon Oils (or **Terpenes**),—consist of C and H, most of them having the formula $C_{10}H_{16}$ and being therefore isomeric with rectified *Oil of Turpentine*, which is the type of this class.

Oxygenated Oils,—contain C, H and O, are highly aromatic and usually consist of a terpene mixed with an oxygenated principle (an acid, an aldehyde, etc.). The oils of Cinnamon and Peppermint are examples of this class.

Sulphuretted Oils,—contain Sulphur in addition to their other elementary constituents, and are pungent and disagreeable in odor and taste; as the oils of Garlic and Mustard. In the latter case the oil is formed by the reaction of the constituent principles in the presence of water and does not preëxist in the plant.

Nitrogenous Oils,—contain N, as the compound Cyanogen, CN, in the form of Hydrocyanic Acid, which is formed only after maceration with water. Examples are the oils of Bitter Almond, Peach-kernels, etc.

Camphors are volatile, aromatic principles, composed of ten atoms of C with various proportions of H and O. They are solid and crystalline at ordinary temperatures, and closely related to the terpenes, with which they are associated in plants and by the oxidation of which they seem to be formed. The principal member of the group is the official *Camphora*, $C_{10}H_{16}O$, which is described under its own title in Part I. Stearoptens obtained from various essential oils are often, though incorrectly, called camphors, as Borneol, Menthol, Eucalyptol, etc.

Borneol, or *Borneo-camphor*, $C_{10}H_{18}O$,—is a secondary alcohol occurring in a tree which grows in Borneo and Sumatra. It may be formed artificially by heating common camphor with alcoholic potash or by treating it with sodium.

Menthol, or *Mint-camphor*, $C_{10}H_{20}O$, occurs in Oil of Peppermint together with a terpene and separates in crystals on cooling the oil. It is a secondary alcohol, is official, and is described under the title MENTHA PIPERITA in Part I.

Miscellaneous Compounds include several organic bodies (phenols, ketones, etc.) which occur as proximate principles in plants but are not referable to the other groups. Among them are—

Anethol, $C_{10}H_{12}O$,—from the oils of Anise and Fennel.
Apiol, $C_{12}H_{14}O_4$,—from the Oil of Parsley.
Carvol, $C_{10}H_{11}O$,—from the Oil of Caraway.
Cineol, *Cajuputol* or *Eucalyptol*, $C_{10}H_{18}O$,—a liquid obtained from the volatile oils of several species of Eucalyptus, also from the oils of Cajuput, Myrtle, Rosemary, Sage and Wormseed.
Eugenol, $C_{10}H_{12}O$,—from Oil of Cloves and other volatile oils.
Guaiacol, $C_7H_8O_2$,—the essential constituent of Creosote.
Safrol, $C_{10}H_{10}O_2$,—obtained from the oils of Sassafras and Camphor and the bark of several plants.
Thymol, $C_{10}H_{14}O$,—a phenol from Oil of Thyme and other volatile oils.

Albuminoids or **Protein Bodies** all contain N, as well as C, O, H and Sulphur. They are formed exclusively in plants, in every part of which they occur in small amounts but in larger quantities in the seeds. When consumed and assimilated by animals they undergo little alteration but enter into the animal tissues and form the chief part of the solid constituents of the blood, muscles, nerves, glands and other organs. They are chiefly valuable as foods, and may be conveniently divided into the following classes:—

Native Albumins, are soluble in water; as Serum-albumin, Egg-albumin, Plant-albumin (in the juices of plants).

Derived Albumins or **Albuminates**, are insoluble in water but soluble in very dilute acids or alkalies; as Syntonin (acid-albumin), Alkali-albumin, Casein, the chief proteid in milk, Legumin or plant-casein. *Gluten*, the chief nitrogenous constituent of the seeds of cereals (wheat, rye, etc.), is believed to be a combination of four albuminoids, gluten-fibrin, gluten-casein, gliadin and mucedin.

Globulins, are insoluble in water but soluble in dilute saline solutions and in very dilute acids or alkalies, and include—Globulin (Crystallin), Myosin, Fibrinogen, Vitellin, Para-globulin and Globin (residue of Hemoglobin, which forms the chief part of the red blood-corpuscles; contains Iron and is closely related to the proteids).

Fibrin (Animal Gluten), is insoluble in water and sparingly soluble in neutral saline solutions and in dilute acids and alkalies. It has a filamentous structure and possesses remarkable elasticity.

Coagulated Proteid, is formed from albumin, fibrin, etc. by the action of heat or alcohol, and is insoluble in water or alcohol but soluble in strong hydrochloric acid and gradually in acetic acid.

Peptones, are formed from albumins by the action of the acid gastric juice. They are highly diffusible and readily soluble in water, but are insoluble in alcohol or ether.

Amyloid Substances, include Ichthin, Ichthidin, Ichthulin and Emydin, which occur in the eggs of fishes and amphibii, also Lardacein or Amyloid Substance, a pathological infiltration into various organs.

Collagenes and **Mucilaginous Bodies**, include Ossein, Collagen (and their derivative Gelatin), also Elastin, Chondrin, Keratin and Mucin.

Ferments are known only by their power of effecting peculiar changes in other organic bodies. The true ferment-substances have not yet been isolated, but they are present in certain preparations obtained from animals and plants, the most important of which are named in the following list, viz.—

Pepsin,—contained in the gastric juice of animals.
Pancreatin,—obtained from the pancreas of animals.
Papayotin (Papain),—from the sap of Carica papaya.
Bromelin,—contained in the juice of the Pineapple.
Ptyalin,—the peculiar ferment of animal saliva.
Diastase,—formed during the germination of seeds.
Emulsin,—the ferment occurring in almonds.
Myrosin,—the ferment contained in mustard-seeds.

The first four above-named are fully described under the title PEPSINUM, *Diastase* under MALTUM, *Emulsin* under AMYGDALA, and *Myrosin* under SINAPIS, in Part I of this book.

CLASSIFICATION OF MEDICINES.

In the present state of knowledge respecting the actions and uses of medicinal agents, no really scientific classification of these substances is possible. Some writers have adopted a system based on the natural relations of the various articles to each other, while many classify them according to their effects on the human system, and others make no attempt at arrangement but treat of them in alphabetical order. The latter method has been chiefly followed in this work, from a conviction that every medicine should first be studied as an individual, both with respect to its physiological actions and its therapeutical applications. When the student has thus made himself familiar with the characteristic features of each article of the materia medica, he may begin, by comparing one with another, to seek acquaintance with their more delicate lights and shades. Some system of classification then becomes imperative as an aid to the memory, and as the titles of the groups to which the various agents belong in any physiological classification are also used to express their actions and uses, the following synopsis is inserted as an appropriate introduction to the section on Materia Medica and Therapeutics.

Accommodation of the Eye is impaired or paralyzed by the following named drugs, acting upon the ciliary muscle, viz.—

Atropine.
Daturine.
Hyoscyamine.
Homatropine.
Physostigmine.
Pilocarpine.
Cocaine.
Gelsemine.

Intraocular tension is increased by Atropine (large doses), Hyoscyamine and Daturine; and is decreased by Physostigmine and by Cocaine. Gelsemine paralyzes the external ocular muscles, especially the levator palpebræ and external rectus, by its action on the terminal nerve filaments.

Acids, considered therapeutically and physiologically, are medicines which in concentrated form act usually as caustics to destroy the tissues; but when administered internally in medicinal doses they check the production of glands having acid secretions if coming in contact with the mouths of their ducts,—and increase the production of those having alkaline secretions. Thus, a dilute *acid* given before meals will *check* the production of the *acid gastric juice* but will *stimulate* that of the *alkaline pancreatic* juice. They should always be largely diluted for internal administration. The principal Acids are Acetic, Citric and Benzoic, from the vegetable kingdom, and Nitric, Phosphoric, Sulphuric and Hydrochloric, from the mineral kingdom.

Alkalies, or **Ant-acids**, from the same standpoint, (see above), are agents which neutralize acids, also act as escharotics on the tissues, and check alkaline and stimulate acid secretions, when in contact with the mouths of the ducts of the glands producing them. Thus, a dilute *alkali* given before meals will *stimulate* the production of the *acid gastric juice*, and if applied to the mouth of the pancreatic duct will *check* the secretion of the *alkaline pancreatic* juice. Alkalies may be subdivided into two groups, named, from their physiological actions, *Direct Antacids*, those which lessen acidity in the stomach, and *Indirect* or *Remote Antacids*, which have no power over acidity of the stomach, but are oxidized in the blood, and excreted as carbonates in the urine, and lessen its acidity. The following List of Alkalies comprises the chief members of both groups, and also some which have the actions of both. They should all be largely diluted before administration.

Direct Antacids. (*Lessen Acidity in the Stomach.*)	*Remote Antacids.* (*Lessen Acidity of the Urine.*)
Liquor Potassæ, Liquor Sodæ.	Liquor Potassæ, Liquor Sodæ.
Carbonates and Bicarbonates of Potassium, Sodium, Lithium, Magnesium and Ammonium.	Carbonates and Bicarbonates of K, Na, Li, Mg and NH_4.
Calcined Magnesia (Magnesia).	Potassium Acetate and Citrate.
Lime-water. Chalk.	Sodium Acetate, Citrate and Phosphate.
Aromatic Spirit of Ammonia.	Lithium Citrate.

Alteratives are remedies which *alter* the course of morbid conditions in some way not yet understood, perhaps by promoting metabolism. They certainly modify the nutritive processes and thereby cure many diseases of chronic type. *Mercury* and *Iodine* are the most prominent agents of this class, the former being endowed with the power of breaking up newly deposited fibrin and disorganizing syphilitic deposits, while the latter acts energetically upon the lymphatic system and promotes absorption. *Arsenic* also is almost specific in many chronic skin affections, and has remarkable power over chronic pulmonary consolidations, probably producing fatty degeneration and softening of the effusion, so that it may be absorbed or expectorated. The principal alteratives are—

Arsenic.
Antimony.
Aurum.
Mezereum.
Sulphur.
Sulphides.
Mercury.
Colchicum.
Guaiacum.
Sanguinaria.
Xanthoxylum.
Calcium Chloride.
Iodine.
Iodides.
Stillingia.
Sarsaparilla.
Cod-liver Oil.
Phosphorus.

Certain therapeutists of laboratory type have, of late years, seen fit to denounce the term *Alterative* as a "cloak for ignorance," but have never been able to present a better designation for a class of agents whose effects are among the most thoroughly established of clinical facts.

Amblyopia, or impairment of vision from nerve-changes, is produced temporarily by Quinine, and may be permanently induced by Tobacco and Alcohol, also by Lead and Urea poisoning.

The sensibility of the eye is increased by Strychnine, the field of vision becoming enlarged, and the vision rendered more acute. If the drug be administered hypodermically the improvement will be more marked in the eye corresponding to the side of the body where the injection was made. The sensibility for color is affected by drugs, *Strychnine* increasing the field for blue, *Eserine* diminishing it for red and green, and *Santonin* causing objects to appear at first of a violet and afterwards of a greenish-yellow color.

Analgesics or Anodynes (ἀν, without, ἄλγος, pain, ὀδύνη, pain),—are remedies which relieve pain either by direct depression of the centres of perception and sensation in the cerebrum, or by impairing the conductivity of the sensory nerve fibres. *Opium* is the most efficient of all analgesics, because it arrests the afferent impressions at every step of their track—at their formation, along the course of their conduction, and at the point where they impinge on the sensorium. The *Local Anodynes* are described under Anesthetics; the list of *General Anodynes* includes the following-named agents:—

Opium, Morphine.
Belladonna, Atropine.
Cannabis Indica.
Stramonium.
Hyoscyamus.
Gelsemium.
Antipyrin.
Acetanilid.
Phenacetin.
Phenocoll.
Exalgin.
Aconite.
Chloroform, Ether, etc.
Conium.
Chloral Hydrate.
Croton-chloral.
Lupulus.

Anaphrodisiacs (ἀν, without, Ἀφροδίτη, Venus),—are medicines and measures which lower the sexual function and diminish the sexual appetite. They act by lessening the excitability of the nerves of the genital organs, by depressing the genital centres in the brain and cord, or by decreasing the local circulation. The principal anaphrodisiacs are named in the following list. [Compare APHRODISIACS.]

Bromides.
Potassium Iodide.
Camphor (at last).
Opium (at last).
Lupulin.
Cocaine.
Tobacco.
Digitalis.
Conium.
Belladonna.
Stramonium.
Gelsemium.
Nauseants.
Purgation.
Venesection.
Ice, locally.
Cold Baths.
Vegetable Diet.

A few drops of a 4 per cent. solution of Cocaine upon the glans penis will destroy all erection-power for a quarter to half an hour.

Anesthetics (ἀν, without, ἀισθήσις, perception),—are agents which temporarily destroy sensation. The Local Anesthetics are described below. The *General Anesthetics* include certain volatile substances, mostly belonging to the chemical groups named alcohols and ethers, which when inhaled sufficiently produce complete unconsciousness and loss of sensation (anesthesia), also lessened motor power. Narcotics also produce more or less anesthesia, but this term is usually restricted to the effects of the volatile agents referred to above. The principal members of this group are—

Ether (Ethyl Oxide).
Methylene Bichloride.
Ethylene Bichloride.
Nitrous Oxide.
Chloroform.
Chlorinated Ethyl Chloride.
Ethyl Bromide.
Pental (Tri-methyl-ethylene).

The list of General Anesthetics also includes Alcohol and many substitution products derived from alcohols and ethers. [Compare the articles entitled ALCOHOL, ÆTHER AND CHLOROFORM in Part I.]

LOCAL ANESTHETICS AND ANODYNES (ἀν, without, οδύνη, pain),—reduce the functions of the sensory nerves until they lose the power of receiving or conducting sensations. Some act by direct depression of the end-organs in the skin, etc., others by impairing the conductivity of the sensory nerves, while some act indirectly by reducing the local circulation. The Anodynes diminish, and the Anesthetics destroy, for a time, the sensibility of the skin and mucous membranes to which they are applied. The chief members of this class are named in the following list:—

Local Anodynes.	*Local Anesthetics.*
Acetanilid.	Extreme Cold, Ice.
Aconite, Aconitine.	Ether Spray.
Belladonna, Atropine.	Ouabaïn.
Opium, Morphine.	Cocaine.
Carbolic Acid.	Antipyrin.
Chloroform.	Erythrophlœin.
Chloral.	Hydrocyanic Acid.
Veratrum, Veratrine.	Carbolic Acid.
Volatile Oils.	Creosote, Guaiacol.
Oil of Turpentine.	Iodoform.
Galvanism.	Orthoform.

Anhidrotics (ἀν, without, ἱδρως, sweat),—are agents which check perspiration, and are the opposites of the Diaphoretics, which promote this secretion. They usually act either—

1. By depressing the action of the sweat-glands.
2. By depressing the excitability of the sweat-centres.
3. By reducing the circulation in the skin.

The most important agents of this class are those named in the following list, the figures indicating their mode of action as above arranged.

- Belladonna.^{1}
  - Atropine.^{1}
- Hyoscyamus.^{1}
- Stramonium.^{1}
- Muscarine.^{2}
- Agaricus Albus.^{2}
- Salvia (Sage).
- Acids, locally.^{3}
- Jaborandi.
- Pilocarpine.
- Nux Vomica.
  - Strychnine.
- Ergot.^{3}
- Sulphuric Acid.
- Chloralami.
- Quinine (?).
- Picrotoxin.
- Dover's Powder.
- Opium ^{2} (small doses).
- Zinc Salts.^{3}
- Local Cold.^{3}

Strychnine, Atropine, Dover's Powder, Jaborandi, Picrotoxin and Zinc Salts are all respiratory stimulants, and very efficient against the sweating of phthisis, though most of them are classed as diaphoretics. This is explained by the theory of accumulation of carbonic acid in the blood by depressed respiration caused by severe coughing, this stimulating the sweat-centres, and being opposed by agents which stimulate the respiratory centre.

Antagonists are agents which directly oppose each other in some or all of their physiological actions, and may be used against each other to *counteract* their effects upon the organism. Antagonistic action takes place in the blood and tissues, after the absorption of both the poison and the antagonist; it is available against poisons administered hypodermically as well as by other channels, and so far as drugs are concerned it is applicable chiefly to vegetable poisons or to those which produce their toxic effects after absorption. In most cases of poisoning by vegetable principles absorption has proceeded so far before professional assistance is obtained that the time for antidotes has passed, and reliance can be placed only upon the physiological antagonists and such antagonistic measures as may support vitality until the poison can be eliminated by the excretory organs of the body. There may be an exception to this rule in the case of Morphine, which, after making the round of the circulation, constantly returns in part to the stomach until finally eliminated, so that repeated washing of that organ with a solution of potassium permanganate, or the ingestion thereof from time to time, may have a continuous antidotal action on such portion of the poison as may have been absorbed. [Compare ANTIDOTES.]

Antagonistic Measures include all such procedures as may tend to antagonize any remote effects of poisons, as artificial respiration, faradization of the respiratory muscles, constant motion or absolute repose, application of heat or cold, douching, etc.

Thus, in the case of poisoning by *Digitalis*, the antagonists which will counteract the effects of such portion of the drug which has been absorbed are the following: *Aconite* or *Morphine* against the cardiac action, the former for the effects of large doses, the latter for those of the long-continued use of the drug. *Saponin* and *Senegin* are the most complete antagonists against Digitalis, their counteraction extending throughout nearly its entire range of action. *Alcohol* is also indicated, as a cardiac stimulant, and absolute *Rest in the recumbent posture* is an antagonistic measure of prime importance, by reason of the liability to sudden cessation of the lowered cardiac action on the assumption of the erect posture by the patient.

In Part I of this book, under the several titles of the poisonous drugs, their most efficient Antidotes and Antagonists are mentioned; but these are more fully described, and are arranged in a form suitable for reference, under the caption POISONING in Part III.

Physiological Antagonism means a balance of opposed actions on particular organs or tissues, excited by medicinal agents and measures or by disease. It may extend throughout the whole or the greater part of the range of action of the opposing agents, or, as is usually the case, may be limited to a few points thereof. There is no instance in which the antagonism of two drugs is absolutely complete along their whole line of action. In a few cases it is nearly so; as with Morphine and Atropine (except as to narcotism), Digitalis and Saponin, and Atropine and Muscarine, the latter being considered the most complete instance known. In most cases the antagonism extends only to certain definite spheres of action, and the antagonists therein may be synergists to each other in other spheres, as the narcosis produced by both Morphine and Atropine. It may be local, affecting a single organ or function, or it may extend to a group of organs, to several associated functions, or over the distribution of the nerves proceeding from a single nerve-trunk (as the vagus) or controlled by a single nerve-centre. Antagonism implies a balance of functional disturbance, not an alteration of structure.

Drugs are rarely antagonistic to each other in the same degree, but, by reason of differences in their mode and time of action, the action of one preponderates over that of the other, so that the latter will not counteract the former to the extent of averting a fatal result, though in the reverse order their counteraction may be most satisfactory. For example, while Chloral is the antagonist to Strychnine, opposing as it does the spinal action of the latter drug, the reverse is true to a very limited extent; and, while Atropine may prevent death from a lethal dose of Aconitine, Morphine or Bromal Hydrate, no one of these three will do so in atropine poisoning.

Two mutually antagonistic principles may exist in the same plant, as the alkaloids Pilocarpine and Jaborine in pilocarpus, and the glucoside constituents of digitalis, one of which, Digitonin, antagonizes the actions of the other three, Digitalin, Digitoxin and Digitalein.

Toxicological Antagonism is a very ancient idea in medicine. Mithridates of Pontus (B. C. 164–124) and other monarchs of the heathen world occupied themselves with the study of poisons and their antidotes and antagonists, established botanical gardens for the purpose of their investigation, and gave their names to what were supposed to be universal preventives against the results of poisoning. In the 16th century Prosper held that theriaca (opium) was an antagonist to all poisons. From 1570 to 1677 many observations were made and published on the treatment of belladonna poisoning by opium, and in 1810 the same matter was made the subject of an inaugural thesis by Lipp. The scientific investigation of drug action and antagonism was not possible until the discovery and isolation of the alkaloids, but followed immediately thereafter, and was begun in 1809 by Magendie upon the upas poison (nux vomica) and its newly discovered alkaloid, strychnine. In 1869 Schmiedeberg and Koppe made their researches on muscarine and atropine, and Liebrich discovered chloral and proved the antagonism of strychnine to its action, the converse of which was shown by Bennett in 1875. In 1870 Fraser published his investigations upon atropine and physostigma, and Preyer his on the antagonistic influence of atropine and hydrocyanic acid on respiration. In 1875 a committee of the British Medical Association made an extended investigation and report on the antagonisms of several drugs, which was supplemented by the work of Vulpian on atropine and pilocarpine in the same year, that of Fothergill in 1877 on aconite, atropine and digitalis, and that of Huseman on the antagonisms of chloral. Much good work has also been done in England by Brunton and Ringer, and in the United States by Wood and Bartholow, on the same lines. The name of Brunton is unalterably associated with the antagonism between amyl nitrite and the spasmodic paroxysm of angina pectoris, a discovery in therapeutic antagonism which was made by him through the exercise of purely scientific reasoning, and which has since been applied to the similar paroxysm induced in poisoning by certain drugs, as cocaine. Bartholow has collected a list of 120 cases of poisoning by opium and belladonna, in which each poison was treated with the other as an antagonist, and in which only 15 proved fatal, a mortality of 12½ per cent.

The following table, modified from Brunton, gives the antagonistic poisons, also their mutual antagonistic and lethal doses in each case in which they have been determined. The doses are expressed in grains or fractions of a grain per pound weight of the animal.

ANTAGONISTS.		ANTAGONISTIC DOSE.		LETHAL DOSE.	
I.	II.	I.	II.	I.	II.
Aconitine and	Atropine,	$\frac{1}{750}$	$1\frac{3}{5}$	$\frac{1}{900}$	7
" "	Digitalin,	$\frac{1}{600}$	$\frac{2}{5}$	$\frac{1}{900}$	1
" "	Strychnine,	$\frac{1}{750}$	$\frac{1}{125}$	$\frac{1}{900}$	$\frac{1}{288}$
Alcohol and	Strychnine,	.	. . .	. . .	$\frac{1}{288}$
Atropine and	Aconitine,	. . .	. . .	7	$\frac{1}{900}$
" "	Chloral,	. . .	. . .	7	7
" "	Hydrocyanic Acid,	. . .	. . .	7	. . .
" "	Jaborandi,	. . .	. . .	7	. . .
" "	Muscarine,	. . .	. . .	7	. . .
" "	Morphine,	. . .	. . .	7	3
" "	Pilocarpine,	. . .	. . .	7	. . .
" "	Phytolaccine,	. . .	. . .	7	. . .
" "	Physostigmine,	. . .	. . .	7	$\frac{1}{25}$
" "	Quinine,	. . .	. . .	7	$1\frac{1}{4}$
Bromal Hydrate and	Atropine,	. . .	. . .	$\frac{1}{900}$	7
Chloral and	Atropine,	. . .	. . .	7	7
" "	Picrotoxin,	. . .	. . .	7	. . .
" "	Physostigmine,	. . .	. . .	7	$\frac{1}{25}$
" "	Strychnine,	. . .	. . .	7	. . .
Chloroform and	Amyl Nitrite,	7	$\frac{1}{300}$	7	. . .
Digitalin and	Aconitine,	. . .	. . .	. . .	$\frac{1}{288}$
" "	Muscarine,	. . .	. . .	. . .	$\frac{1}{900}$
" "	Saponin,	. . .	. . .	. . .	. . .
Gelsemium and	Opium,	$\frac{9}{55}$	$\frac{1}{20}$	$\frac{1}{6}$	$\frac{1}{20}$
" "	Atropine,	3	$\frac{2}{7}$	3	7
Morphine and	Caffeine,	$\frac{1}{3}$	. . .	$\frac{1}{3}$	$1\frac{3}{4}$
" "	Chloroform,	. . .	. . .	. . .	. . .
Muscarine and	Atropine,	. . .	. . .	. . .	. . .
Opium and	Atropine,	. . .	. . .	. . .	7
" "	Gelsemium,	. . .	. . .	. . .	7
" "	Veratrum Viride,	. . .	. . .	. . .	. . .

Anthelmintics (*ἀντί*, against, *ἕλμινς*, a worm),—are agents which destroy (vermicides) or expel (vermifuges) worms inhabiting the intestinal canal. The principal vermifuges are the purgatives Castor Oil, Jalap and Scammony,—and the vermicides are classed according to the worm they are each most efficient against, thus,—

Thread Worms	*Round Worms*	*Tape Worms*
(*Oxyuris Vermicularis*).	(*Ascaris Lumbricoides*).	(*Teniæ, etc.*).
Alum.	Santonica.	Filix Mas.
Sulphate of Iron.	Santonin.	Kamala.
Lime Water.	Spigelia.	Kousso.
Quassia.	Chenopodium.	Granatum.
Eucalyptol.	Azedarach.	Pelletierine.
Sodium Chloride.	Senna } with the	Pepo.
Tannin.	Calomel } above.	Turpentine.
Veg. Astringents.	Naphtalin.	Chloroform.
Naphtalin.		Naphtalin.

The substances enumerated in the first column are all used locally by enema. *Adjuncts* to these remedies are such agents as prevent the excessive secretion of intestinal mucus, which affords a nidus for the worms. Such are Bitter Tonics and preparations of Iron, also Ammonium Chloride and Sodium Chloride.

Antidotes (*ἀντί*, against, *δίδωμι*, I give),—are agents which affect a poison either physically or chemically, or both, so as to remove it from the body or alter its character by forming with it an insoluble or inert compound before its absorption, with the object of *preventing* its toxic action upon the organism. Antidotes do their work in the alimentary canal or in the respiratory passages, and are applicable to vegetable as well as mineral poisons, but are not available against poisons administered hypodermically. They include sundry chemical substances, also measures of various kinds, and may be divided into two classes: (1) *Chemical* or *True Antidotes*, which unite chemically with the poison, converting a soluble and absorbable substance into a compound which is more or less insoluble and non-absorbable, or harmless though soluble; (2) *Mechanical Antidotes* or *Antidotal Measures*, which include such medicinal or mechanical processes as tend to remove a poison from the body, either before or after the use of an antidote; and include emesis, the use of the stomach-pump, purgation, etc. The term *Antidotal Treatment* covers the employment of both antidotes and antidotal measures, and is often used in a still wider sense, namely, to mean all the treatment of a case of poisoning, including the use of Antagonists as well as that of Antidotes. [Compare ANTAGONISTS.]

Thus, *Tannic Acid* is the antidote for poisoning by *Digitalis*, as it forms with the active toxic principles of the drug chemical compounds (tannates) which are almost insoluble and therefore comparatively harmless. But as these tannates are not entirely inert, an antidotal measure, evacuation of the stomach, must also be employed, by the administration of *Zinc Sulphate* or any other emetic, or by the use of a stomach-pump.

Antiperiodics are remedies which affect certain periodical febrile diseases, lessening the severity of their paroxysms or preventing their return. They act probably by arresting the development in the blood of successive crops of pathogenic organisms, upon which the disorders are supposed to depend. The principal antiperiodics are—

Cinchona Bark and its alkaloids, especially Quinine.
Bebeeru Bark and its alkaloid Berberine.
Salicin, Salicylic Acid, Salicylates.
Opium and its alkaloid, Narcotine.
Arsenic.
Eucalyptol.
Iodine.

Quinine is the most powerful antiperiodic and *Arsenic* ranks next in order of efficiency.

Antiphlogistics (*ἀντί*, against, *φλογίζω*, I burn),—are measures and medicines which are supposed to have some specific power in reducing inflammation. The term is becoming obsolete, but frequent references are still seen to the influence of ***Mercury*** and ***Opium*** in inflammations of serous membranes, ***Antimony*** and ***Aconite*** in inflammations of the respiratory tract and organs, and to the power of ***Veratrum Viride*** over puerperal metritis. The chief antiphlogistics are—

Aconite. Opium.
Veratrum Viride.
Tartar Emetic.
Mercury.
Gelsemium.
Digitalis.
Ergot.
Ipecacuanha.
Potassium Nitrate.
Rest (recumbent position).
Venesection.
Local Depletion.
Purgation.
Counter-irritation.
Cold (locally).

Antipyretics (*ἀντί*, against, *πυρετὸς*, fever),—are agents or measures which reduce the body-temperature when abnormally high. This may be done by two principal methods, and the agents doing either accomplish the result by five different actions, as follows, viz.—

(*a*) *Lessening the Production of Heat, by* .	1. Diminishing tissue-change. 2. Reducing the circulation.
(*b*) *Promoting the Loss of Heat, by* . . .	3. Dilating the cutaneous vessels, and producing increased radiation. 4. Producing perspiration, and its evaporation. 5. Abstracting heat from the body.

The following list contains nearly all the antipyretics, the numbers following each referring to its proper method of action, as enumerated above:—

Quinine.^{1}
Quinidine.^{1}
Cinchonine.^{1}
Cinchonidine.^{1}
Berberine.^{1}
Benzoic Acid.^{1}
Carbolic Acid.^{1,3}
Picric Acid.^{1}
Salicin.^{1}
Salicylic Acid.^{1}
Sodium Salicylate.^{1,4}
Quinine Salicylate.^{1}
Methyl Salicylate.^{1}
(Oil of Gaultheria.)
Trimethylamin.^{2}
Salol.^{1}
Acetanilid.^{1,4}
Antipyrin.^{1,4}
Phenacetin.^{1,4}
Chinolin.^{1}
Resorcin.^{1}
Kairin.^{1,4}
Kairolin.^{1,4}
Hydroquinon.^{1}
Thallin.^{1,4}
Pyrocatechin.^{1}
Pheno-resorcin.^{1}

Eucalyptol.[1]
Thymol.[1]
Other Essential Oils.[1]
Alcohol.[1,3]
Digitalis.[2]
Aconite.[2]
Camphor.[1]
Antimonials.[2,4]
Veratrine.[2]
Colchicum.[2]
Leeching.[2]
Cupping.[2]
Blistering.[2]
Poulticing.[2]
Nitrous Ether.[3,4]
Dover's Powder.[4]
Cold Bath.[5]
Cold Drinks.[5]
Ice to Surface.[5]
Cold Sponging.[5]
Wet Packing.[5]

Purgation and Venesection produce antipyretic results, but their mode of action is doubtful (Brunton). The Body-temperature is raised by *Belladonna* (or Atropine) and by *Cocaine*, but not to such a degree as to constitute fever or enable them to be classed as pyretics. *Tuberculin*, various albumoses, and certain animal poisons, as that of shell fish, will also produce a rise of temperature.

Antiseptics (ἀντί, against, σηπτικός, putrefaction),—are agents which prevent or retard septic decomposition, by destroying the bacteria which produce it, or by arresting their development. The chief antiseptics are named in the following list, the first column containing the most powerful ones, the middle column those which are moderately antiseptic, and the third column the weakest members of the group.

Strong.	*Moderate.*	*Feeble.*
Corrosive Sublimate.	Boric Acid.	Benzoic Acid.
Formaldehyde.	Chloral Hydrate.	Sodium Borate.
Oxygenated Water.	Ferrous Sulphate.	Sodium Bicarbonate.
Silver Nitrate.	Zinc Sulphate.	Calcium Chloride.
Gold Chloride.	Arsenic.	Sodium Chloride.
Zinc Chloride.	Quinine.	Barium Chloride.
Copper Sulphate.	Salicin.	Strontium Chloride.
Iodine. Bromine.	Sodium Salicylate.	Ammonium Chloride.
Chlorine.	Salol.	Ammonium Sulphate.
Potassium Permanganate.	Mercuric Iodide.	Alcohol (pure).
Carbolic Acid. Creosote.	Eucalyptol.	Sodium Hyposulphite.
Chloroform. Orthoform.	Sulphurous Acid.	Potassium Chlorate.
Thymol. Menthol.	Sulpho-carbolates.	Potassium Arsenate.
Hydronaphtol.	Bismuth Subgallate.	Potassium Iodide.
Alum. Tannin.	Resorcin.	Manganese Chloride.
Acetanilid. Antipyrin.	Coffee.	Glycerin.

The first four named are the most powerful. *Corrosive Sublimate* is probably the most powerful of all, but it is very poisonous. The best are those which act sufficiently on the microbes without injuring the tissues. *Chlorine*, *Bromine* and *Iodine* are too irritant for general use. *Salol* is the best intestinal antiseptic, though *Naphtol* will destroy micro-organisms in the stomach and intestines. We do not know any drugs which, taken internally or inhaled, will certainly destroy micro-organisms in the body, unless sufficiently concentrated to be fatal to the patient.

Antispasmodics (ἀντί, against, σπασμός, a spasm),—are agents which prevent or allay spasm of voluntary or involuntary muscles in any portion of the organism. Some of the agents belonging to this class act by tonic stimulation of the higher nervous centres, the coordinating power, and the circulation, as Alcohol and Ether in small doses, Camphor, Musk, Valerian, etc.; others by a depressant influence on the motor centres, as the Bromides, and still others by paralysis of the end-organs of the vaso-motor nerves, as Amyl Nitrite. A few depress all the vital functions, as Aconite, Tobacco, Lobelia, Hellebore, and Prussic Acid; and a number stimulate the muscular fibres of the intestines to expel gaseous accumulations, namely—Asafetida, Cajuput, Valerian, Musk, Aromatic Oils, etc. They are used in convulsive affections, especially asthma and other spasmodic diseases of the respiratory organs, hysteria, chorea, angina pectoris, epilepsy, etc. The principal antispasmodics are named in the following list:—

Alcohol. Ether.
Paraldehyde.
Chloroform.
Amyl Nitrite.
Nitrites.
Bromides.
Potassium Iodide.
Potassium Nitrate.
Arsenic.
Valerian.
Conium.
Aconite.
Lobelia.
Tobacco.
Hellebore.
Opium.
Belladonna.
Stramonium.
Hyoscyamus.
Hydrocyanic Acid.
Physostigma.
Curare.
Ammoniac.
Castor.
Musk.
Galbanum.
Sumbul.
Ipecacuanha.
Senega.
Silver Salts.
Zinc Salts.
Copper Salts.
Asafetida.

Antizymotics (*ἀντί*, against, *ζυμωσίς*, fermentation),—are agents which arrest the fermentative processes, which depend upon the action of unorganized ferments (enzymes), as diastase, ptyalin, pepsin, etc., or upon that of organized ferments, as the yeast-plant, bacteria, etc. The Antizymotics are usually subdivided into two groups, respectively entitled Antiseptics and Disinfectants, (which see).

Fermentation is a general name for certain processes of decomposition, during which certain carbon compounds called *Ferments* act upon other carbon compounds, as on their food,—splitting these latter up, setting free their elementary constituents, and thereby leading to the formation of still other carbon compounds, by the rearrangement of the freed molecules. These processes are of two kinds, viz.:—

(1)—Those in which water is taken up, (hydration),—chiefly carried on by enzymes.

(2)—Those in which O is transferred from the H to the C association, as in lactic and alcoholic fermentation, and the putrefactive processes,—and which are chiefly carried on by the agency of organized ferments.

The Ferments producing these fermentative changes are also carbon compounds, and are divisible into two groups, viz.:—

Enzymes, or *Organic Ferments*,—have no definite structures, and are unorganized, *i. e.*, not living,—as Diastase, Ptyalin, Pepsin, etc.

Organized Ferments,—are minute, living organisms, as the moulds, yeast-plant, bacteria, and other members of the Protophytes, the lowermost class of plants, which, in the course of their life history, split up the carbon compounds in which they live, appropriating some part of their elements.

Antizymotic Drugs are drugs which arrest or inhibit these fermentative processes, either by destroying or by rendering inactive the causative ferments.

Aphrodisiacs (*Ἀφροδίτη*, Venus),—are medicines which stimulate the sexual appetite and power. They act by reflex or direct action upon either the cerebral or the spinal genital centre. Tonics are indirectly aphrodisiac, as are all measures which promote the general bodily nutrition. The chief agents used as direct aphrodisiacs are named in the following list. [Compare ANAPHRODISIACS.]

- Nux Vomica.
    - Strychnine.
- Cannabis.
- Cantharis.
- Phosphorus.
- Aurum.
- Cimicifuga.
- Serpentaria.
- Sanguinaria.
- Opium (at first).
- Camphor (at first).
- Damiana (?).
- Ergot.
- Iron.
- Alcohol.
- Bitter Tonics.
- Flagellation.
- Meat Diet.

Strychnine acts by increasing general nutrition and exalting the reflex excitability of the genital centres. *Hemp* probably only causes a mild delirium which may or may not take a sexual direction. *Cantharides* acts by direct irritation of the mucous lining of the urethra, and is dangerous in aphrodisiac doses. *Alcohol* in small doses excites the genital centre in the brain; so also *Opium* and *Camphor*, the latter being decidedly anaphrodisiac after a time. The power of *Damiana* is doubtful. *Urtication* and *Flagellation* of the nates produce priapism by irritation of the genital centre in the cord through the sensory nerves of the part. *Ergot* is considered useful by contracting the dorsal vein of the penis, preventing its emptying too rapidly.

Astringents (*ad*, to, *stringo*, I bind),—are agents which produce contraction of muscular fibre and condensation of other tissues, the first probably by direct irritation, the second by precipitating its albumin and gelatin. They also lessen secretion from mucous membranes. The principal astringents are—

- Acids.
- Alcohol.
- Alum.
- Chalk.
- Lime.
- Creosote.
- Carbolic Acid.
- Tannic Acid.
- Gallic Acid.
- Catechu.
- Galls.
- Kino.
- Oak-bark.
- Uva-Ursi.
- Bismuth Subnitrate, etc.
- Cadmium Sulphate.
- Copper Sulphate.
- Ferric Chloride.
- Lead Acetate.
- Silver Nitrate.
- Zinc Sulphate.

Sulphuric Acid, Gallic Acid, and Lead Acetate are examples of *Remote Astringents*, acting on internal organs through the blood. Those which affect the part to which they are applied are *Local Astringents*, and include the others named above.

Cardiac Sedatives lessen the force and the frequency of the heart's action. They are used to control palpitation and overaction of that organ, and to slow the pulse in febrile conditions in sthenic subjects, especially when local inflammation is the exciting cause of the fever. The chief cardiac sedatives are—

- Aconite.
- Antimony.
- Veratrum Viride.
- Muscarine.
- Quinine, in full doses.
- Pilocarpine.
- Digitalis.
- Ouabaïn.
- Emetine.
- Senega, Saponin.
- Hydrocyanic Acid.
- Potassium Salts.
- Cold.

Aconite, *Veratrum*, *Muscarine*, *Pilocarpine*, *Saponin* and *Hydrocyanic Acid*, are direct cardiac poisons, depressing the heart muscle and the cardiac motor ganglia; *Muscarine* and *Pilocarpine* also stimulate the inhibitory ganglia. *Digitalis* stimulates the vagus centre and the cardiac muscle, and acts as a sedative in many cases by slowing the cardiac rate and giving it a regular rhythm. *Aconite* is said by some authorities to relax inhibition, by others to stimulate the vagus centre. *Antimony* depresses the motor ganglia, *Potassium* depresses the cardiac muscle.

Cardiac Stimulants rapidly increase the force and frequency of the pulse in depressed conditions of the cardiac apparatus. One of the most useful agents of this class is *Alcohol* in some form, its action being largely due to a reflex influence excited through the nerves of the mouth and stomach. It should therefore be given in but slightly diluted form, and in small quantities frequently. *Ether* is next in value and still more rapid in action, and the local application of *Heat* is one of the most powerful and available. *Ammonia* has an energetic action as a stimulant to the vaso-motor centre, as well as a reflex one upon the heart similar to that of Alcohol. The chief cardiac stimulants are—

Alcohol.
Ammonia.
Atropine.
Nitroglycerin.
Orchitic Extract.
Spermine.
Hydrastinine.
Cocaine.
Ether. Chloroform.
Heat (locally).
Continuous Galvanic Current.
Counter-irritation.
Sparteine.
Camphor.
Aromatic Oils.
Turpentine.
Opium and Morphine, in small doses.

Cardiac Tonics, when given in moderate doses, stimulate the cardiac muscle, slowing and strengthening its contractions. In large doses they are apt to produce irregular action of the heart, and some of them have more or less of a tendency to cause sudden death by syncope if pushed to any great extent. The most important of these agents are—

Digitalis.
Convallaria.
Cimicifuga.
Sparteine.
Squill.
Erythrophlœin.
Caffeine.
Saponin.
Strophanthus.
Strychnine.
Helleboreïn.
Adonidin.

Digitalis acts partly by stimulation of the vagus end-organs in the heart, thus increasing cardiac inhibition, and partly by direct stimulation of the cardiac centre in the medulla, as well as by a direct influence on the heart muscle itself. It contracts the arterioles and raises the blood-pressure greatly. *Convallaria*, *Erythrophlœin*, *Squill*, and *Cimicifuga* act similarly but less powerfully, and are correspondingly safer. *Strophanthus* is still better, as it does not affect the vessels, and therefore does not raise the blood-pressure.

Carminatives (*carmino*, I soothe),—promote the expulsion of gas from the stomach and intestines by increasing peristalsis, stimulating the circulation, and relaxing the cardiac and pyloric orifices of the stomach. They also act as diffusible stimulants, both of the bodily and mental faculties. The principal carminatives belong to the aromatic oils, alcohols or ethers, and are named in the following list:—

Asafetida.
Camphor.
Capsicum.
Cardamom.
Chloroform.
Ether.
Fennel.
Ginger.
Horse-radish.
Mace.
Mustard.
Pepper.
Serpentaria.
Spirits.
Oil of Anise.
Oil of Cajuput.
Oil of Caraway.
Oil of Cinnamon.
Oil of Cloves.
Oil of Coriander.
Oil of Eucalyptus.
Oil of Fennel.
Oil of Peppermint.
Oil of Spearmint.
Oil of Nutmeg.
Oil of Pimento.
Oil of Valerian.

Cathartics or Purgatives (*καθαίρω*, *purgo*, I cleanse),—are agents which increase or hasten the intestinal evacuations. According to their respective degrees and direction of action they are subdivided into several groups, as follows:—

Laxatives (*laxo*, I loose), or *Aperients* (*aperio*, I open),—include those which excite moderate peristalsis, and produce softened motions without irritation. *Sulphur* is the typical laxative.

Simple Purgatives,—cause active peristalsis, and stimulate the secretions of the intestinal glands, producing one or more copious and semifluid motions with some irritation and griping. *Senna* is the type of this group, which also includes Aloes, Rhubarb, Castor Oil, etc.

Drastic Purgatives (*δράω*, I act),—act still more intensely, producing violent peristalsis and watery stools, with much griping pain, tenesmus, and borborygmi. They irritate the intestinal mucous membrane, cause exosmosis of serum from its vessels, and in large dose set up inflammation and symptoms of irritant poisoning. *Jalap* is a typical drastic.

Saline Purgatives.—This group includes the neutral salts of metals of the alkalies or alkaline earths. They stimulate the intestinal glands to increased secretion, and by their low diffusibility impede reabsorption, causing an accumulation of fluid in the intestinal tract, which, partly from the effect of gravity and partly by gentle stimulation of peristalsis excited by distention, reaches the rectum and produces a copious evacuation. *Magnesium Sulphate* and *Sodium Sulphate* are the typical salines. They should be given in plenty of water and during active movement (as in walking) in order to produce their best effects.

Hydragogue Purgatives (*ὕδωρ*, water, *ἄγω*, I bring away),—include the most active of the drastic and saline groups, especially those which remove a large quantity of water from the vessels. *Elaterium* is a typical hydragogue cathartic.

Cholagogue purgatives (*χολή*, bile, *ἄγω*, I bring away),—are those agents which stimulate the discharge of bile and produce free purgation at the same time, the stools being green-colored ("bilious") and liquid. *Podophyllin* is the type of this group.

The principal Cathartics are the following-named :—

Laxatives.

Sulphur.
Magnesia.
Cassia.
Manna.
Figs. Prunes.
Tamarinds.
Honey.
Cascara Sagrada.
Physostigma.
Ergot.
Belladonna.
Stramonium.
Hyoscyamus.
Almond Oil.
Olive Oil.
Soap.
Taraxacum.
Glycerin.
Oatmeal.
Bran Biscuit.
Brown Bread.

Simple Purgatives.

Senna.
Aloes.
Rhubarb.
Castor Oil.
Rhamnus Frangula.
Ox-gall.
Calomel.
Small doses of drastics, salines or cholagogues.

Saline Purgatives.

Magnesium Sulphate.
Magnesium Citrate.
Potassium Sulphate.
Potassium Tartrate.
Potassium Bitartrate.
Sodium Sulphate.
Sodium Phosphate.
Sodium Chloride.
Pot. et Sodium Tartrate.
Manganese Sulphate.

Drastics.

Jalap. Gamboge.
Colocynth.
Elaterium.
Scammony.
Croton Oil.
Cathartic Acid, hypodermically.

Hydragogues.

Elaterium.
Gamboge.
Potassium Bitartrate.
Croton Oil.
Salines in large doses.

Cholagogues.

Podophyllin.
Mercurials.
Aloes. Rhubarb.
Euonymin.
Iridin.

Cerebral Depressants lower or suspend the functions of the higher cerebrum after a preliminary stage of excitement. Under this head may be included the Hypnotics, Narcotics, General Anesthetics, and several of the Antispasmodics, all acting on the cells of the convolutions; at first stimulating the brain-functions, they produce after a time stupor, coma and insensibility.

The most useful of this class are the Bromides, Zinc Salts and Caffeine, as they also diminish reflex excitability and thus secure rest of the nervous system. Some of them are decidedly dangerous, as they may paralyze the heart or the medulla and its centres of organic life before the consciousness is much disturbed; such being Chloroform, Aconite, Opium, and the irritant poisons, also Carbolic Acid.

Cerebral Excitants are remedies which increase the functional activity of the brain, without producing any subsequent depression, or any suspension of the cerebral functions. They act partly by increasing the action of the heart and consequently the rapidity of the circulation, partly by a direct action upon the gray matter of the brain. The chief members of this group are—

Acetic Acid (inhaled).
Alcohol (at first).
Ammonia (inhaled).
Ammoniac.
Asafetida.
Camphor.
Cannabis.
Coffee, Caffeine.
Tea, Theine.
Guarana, Guaranine.
Coca, Cocaine.
Ether.
Quinine.
Tobacco,
Strychnine.
Valerian.

The Cerebellum is markedly disturbed by the few drugs which affect it specifically, their action upon its different lobes producing various disturbances of coordination and equilibrium. *Alcohol* in considerable dose causes a staggering gait, and a tendency to fall; and different preparations thereof seem to affect different portions of the cerebellum. Intoxication by wine or beer is said to be accompanied by a tendency to fall sideways,—that by whiskey, especially Irish whiskey, an inclination to fall on the face,—and that by cider, a backward tendency; and these disturbances correspond exactly with those caused by injury to different lobes of the cerebellum (Brunton). *Apomorphine* in large doses seems to act upon the cerebellum or corpora quadrigemina, as the animal poisoned by it does not vomit, but moves round and round in a circle.

Ciliary Excitants are substances which, when dissolved in the mouth, promote the expectoration of bronchial mucus by their reflex excitation of the tracheal and bronchial cilia. This group includes such agents as the Chlorides of Ammonium and Sodium, Potassium Chlorate and Gum Acacia.

Deliriants excite the functions of the higher brain to such a degree as to disorder the mental faculties, producing intellectual confusion, loss of will-power, delirium and even convulsions. They are all narcotics (though all narcotics are not deliriants), and the most important may be listed as follows:—

Belladonna.
Stramonium.
Hyoscyamus.
Turpentine.
Alcohol.
Chloral.
Ether.
Chloroform.
Cannabis Indica.
Lupulus (at first).
Opium (at first).
Nitrous Oxide Gas.

Demulcents (*demulceo*, I soothe),—are substances usually of oleaginous or mucilaginous nature, which soothe and protect the parts to which they are applied. This term is generally used for substances employed for mucous membranes, and the term *Emollients* for similar agents used on the skin. The chief agents belonging to this class are:—

Acacia.
Cetraria.
Barley.
Liquorice.
Starch.
Glycerin.
Flaxseed.
Gelatin.
Honey.
Marsh-mallow.
White of Egg.
Almond.
Olive oil.
Isinglass.
Tragacanth.
Bland Oils.

Dental Anodynes are substances employed locally in toothache due to caries exposing a nerve filament. Such are *Aconite*, *Opium* and *Cocaine salts*,—also Carbolic Acid, Creosote, Chloral, and Potassium Chlorate. A solution, containing the three first named, applied on a pledget of cotton, will promptly relieve whenever the nerve is accessible. *Chloral* should never be employed for this purpose, as in solution sufficiently strong to be of any service it is very apt to cause sloughing of the gum, especially if injected thereinto by a hypodermic syringe, as is frequently done by ignorant dentists, who advertise the "extraction of teeth without pain."

Dentifrices (*dens*, a tooth, *frico*, I rub),—are medicated powders or pastes applied with a stiff brush to cleanse the teeth and gums. *Chalk* is the basis generally used, for its mechanical action and its alkaline quality. Antiseptics, as *Borax*, *Quinine*, *Carbolic Acid*, etc., should also be employed, so as to prevent the acid fermentation of food products between the teeth and the consequent decay of the dentine. *Tincture of Myrrh* is an excellent ingredient, being an aromatic local stimulant and disinfectant.

Many drugs affect the teeth injuriously, such being the Mineral Acids, Persalts of Iron and Alum. The first two should be taken through a glass tube, and the mouth should be rinsed afterwards with a weak alkaline solution.

Deodorants are agents which destroy foul odors. The *Volatile Deodorants* are chiefly oxidizing and deoxidizing substances, acting chemically on the obnoxious gases; while the *Non-volatile* ones are mainly absorbents, which condense and decompose the effluvia. The deodorants in general use are the following-named:—

Formalin.
Chlorine Gas.
Sulphurous Acid Gas.
Hydrogen Dioxide.
Potassium Permanganate.
Coffee, freshly roasted.
Charcoal.
Earth. Lime.
Ferrous Sulphate.

For removing the fetid exhalations emitted by the feces, the following powder is a very efficient and cheap deodorizing and disinfecting agent. Zinc Sulphate, lbs. ij, Sulphuric Acid, ʒjss to ʒijss, Essence of Mirbane, ʒj, Indigo Blue, gr. ij. About a dessertspoonful of this salt is placed in the bed-pan or chamber utensil before it is used. Contact with urine or a liquid stool causes its prompt solution, deodorization is instantaneous, the liquid excreta are at once sterilized, and the fetor is changed to a rather agreeable odor. *Oil of Eucalyptus* has the property of spreading rapidly over water in a thin film, and if a few drops are sprinkled over the water in the pan of a water closet before using the latter, no fecal odor will arise therefrom.

Destructive Metamorphosis of the tissues is promoted by a number of agents, most of which are classed as *Alteratives* or as *Astringents*, the most important of which are the following-named :—

Alkalies.
Vegetable Acids.
Metals and their salts.
Colchicum.
Sulphides and Iodides.
Sarsaparilla.
Stillingia.
Xanthoxylum.
Tannic and Gallic Acids, and substances containing them.

Destructive Metamorphosis may be diminished by many substances, the following-named being the chief ones :—

Alcohol.
Glycerin.
Oils and Fats.
Salicin.
Salicylates.
Quinine.
Resorcin.
Chinoline.
Cocaine.

Diaphoretics and Sudorifics (*δίαφορέω*, I carry through ; *sudor*, sweat, *facio*, I make),—are remedies which increase the action of the skin and promote the secretion of sweat. When they act energetically, so that the perspiration stands in beads upon the surface, they are known as *Sudorifics*. They may be subdivided into the following groups, viz.—

(1) *Simple Diaphoretics*, which enter the circulation and are eliminated by the sudoriferous glands, which they stimulate to increased action.

(2) *Nauseating Diaphoretics*, which produce relaxation and the dilatation of the superficial capillaries.

(3) *Refrigerant Diaphoretics*, which reduce the circulation, at the same time acting directly on the sweat-centres in the spinal cord and medulla.

The principal diaphoretics are the following-named, the figures referring to their respective supposed modes of action as indicated above ;—

Aconite.[3]
Veratrum Viride.[3]
Tobacco.[2,3]
Lobelia.[2,3]
Alcohol.[2,3]
Ether.[2,3]
Nitrous Ether.[2,3]
Salicylates.[1]
Jaborandi.[1,3]
Pilocarpine.[1,3]
Ipecacuanha.[2]
Opium[2,3](large doses).
Dover's Powder.[2]
Tartar Emetic.[2]
Sulphur.[1]
Camphor.[1]
Cocaine.[3]
Ammonium Acetate.[1]
Ammonium Citrate.[1]
Potassium Salts.[3]
Mezereon.[1]
Sarsaparilla.[1]
Guaiacum.[1]
Serpentaria.[1]
Sassafras.[1]
Senega.[1]
Vapor Bath.[2]
Turkish Bath.[2]
Wet Pack.[2]
Warm Drinks.[2]

Diluents (*diluo*, I dilute),—are indifferent substances which, after their absorption, dilute the excretory fluids and enable the latter to hold more solid material in suspension. *Water* is the one true diluent, whatever form it may be disguised in, as teas, weak fluid foods, acid drinks, etc.

Discutients or Sorbefacients (*discutio*, I dissipate ; *sorbere*, to suck),—are agents which promote absorption, and may be divided into two classes ; (1) those which stimulate the lymphatics to the removal of morbid or inflammatory deposits, (2) those which promote the imbibition of nutritive or medicinal material into the system. [Compare ALTERATIVES.] These agents include the following-named :—

Arsenic.
Mercury.
Iodine.
  Iodides.
Cadmium.
Ichthyol.
Lanolin.
Oleic Acid.
Cacao Butter.
Massage.
Vapor Bath.
Hot Water Bath.
Poultices.
Counterirritation.
Galvanism.

Lanolin and *Oleic Acid* have remarkable power of penetration through the skin and are used as excipients for drugs which are to be administered by cutaneous absorption. *Cacao Butter* possesses the same penetrative property, and is usually employed in making medicated suppositories.

Disinfectants destroy the specific germs of communicable diseases, many of which belong to the microbe class, hence many antiseptics are also disinfectants. They act in several modes, some as oxidizants, others by combining with albumin, others by chemical combination forming substitution-compounds, others by arresting molecular changes, and still others by altering the reaction of the media containing the germs. The principal disinfectants are—

Corrosive Sublimate.
Formaldehyde.
Heat (230° to 250° F.).
Potassium Permanganate.
Zinc Chloride.
Zinc Sulphate.
Hydrogen Dioxide.
Carbolic Acid.
Creolin.
Lysol.
Potassium Bichromate.
Ferrous Sulphate.
Sulphurous Acid.
Nitrous Acid.
Chlorine.
Chlorinated Lime.
Chlorinated Soda.
Iodine. Bromine.
Lime (fresh).
Thymol.
Camphor.

Condy's Fluid is an aqueous solution of Potassium Permanganate, 2 parts in 100, or gr. 176 in ℥20. *Burnett's Fluid* is a solution of Zinc Chloride, containing about 50 per cent. of the salt, and equivalent to the official Liquor Zinci Chloridi. *Labarraque's Solution* is the same as the official Liquor Sodæ Chloratæ. *Sanitas* is an aqueous solution of oxidized Turpentine and contains Hydrogen Dioxide, also Thymol and Camphor.

The popular idea of disinfecting *the air* of a room by burning sulphur, etc., is an absurdity, because foul air is easily removed by simple ventilation. In disinfecting a room in which there has been a case of contagious or infectious disease, the true aim is to kill the germs contained in the dust on ledges, in the crevices between the boards, or adhering to the walls, and a dry gas is powerless for this purpose, which is best accomplished by using a *Corrosive Sublimate Solution* of the strength of 1 in 1000; or by *Lime* washing, provided that the lime be freshly burnt, and caustic; or by spraying with *Formalin*, or by dropping the latter on hot plates or sheets of hot metal.

Diuretics (διούρησις, urination),—are agents which promote the secretion of urine, either by raising the local or general blood-pressure and so increasing the renal circulation, by stimulating the secreting cells or nerves of the kidneys, or by flushing the kidneys with water. Diuretics may be classified according to their physiological action or according to the different purposes for which they are employed. *Refrigerant Diuretics*, especially the salines, excite the renal epithelium, induce a hyperemic condition of the kidneys and increase the water of the urine. hey possess a sedative action upon the heart and the general circulation, sed to excess they depress the heart and impoverish the blood. um Chlorate is a decided renal irritant, and should never be used iuretic. *Hydragogue Diuretics* increase the water of the urine largely, and in general act by raising arterial pressure, either—(*a*) throughout the body, or (*b*) locally in the kidneys. This they accomplish in various ways, direct and indirect,—increasing the action of the heart, counteracting the efferent vessels or dilating the afferent vessels, so as to raise the blood-pressure in the glomeruli, etc. The action of the *Stimulant Diuretics* is directly upon the renal tissue, by which they are largely eliminated from the body. In small or moderate doses they dilate the renal arterioles, increase the renal blood-supply, and so induce diuresis, but in large doses they irritate the renal epithelium, contract the renal arterioles, diminish the renal blood-supply, excite renal inflammation, render the urine albuminous and bloody, and may even induce suppression of the urine. All the members of this division should be used with caution.

Individual members of the diuretic class act in various modes, some of them in more than one manner, and probably as follows, viz.—

1. By increasing the action of the heart (Alcohol, Digitalis, etc.) or by contracting the intestinal and other vessels, thus raising the general blood-pressure.
2. By dilating the afferent renal vessels, thereby increasing the renal blood-supply and raising the pressure in the glomeruli.
3. By contracting the efferent vessels, raising the pressure in the glomeruli and lessening absorption in the tubules, or both.
4. By stimulating the secreting cells or nerves of the kidneys.
5. By flushing the kidneys, as by the ingestion of Water in large quantity.

The following list contains the most important agents of this group, which are usually subdivided into the three classes indicated by the subtitles. The numbers refer to the probable modes of action of the drug in the above synopsis:—

Refrigerant Diuretics.
Potassium Acetate.[4]
Potassium Bitartrate.[4]
Potassium Citrate.[4]
Potassium Chlorate.[4]
Potassium Nitrate.[4]
Sodium Acetate.[4]
Sodium Chlorate.[4]
Sodium Chloride.[4]
Ammonium Acetate.[4]
Calcium Chloride.[4]
Lithium Carbonate.[4]
Lithium Citrate.[4]
Magnesium Citrate.[4]
Magnesium Sulphate.[4]
Water.[5] Milk.[5]
Carbonic Acid.
Cold to surface.[1]

Hydragogue Diuretics.
Digitalis.[1,2]
Strophanthus.[2]
Convallaria.[1]
Cimicifuga.[1,2]
Adonis vernalis.[1,2]
Erythrophlœum.[1]
Squill.[1,2]
Broom.[2] Sparteine.[3]
Calomel.[4]
Caffeine.[1,4]
Theobromine.[4]
Apocynum.[1,2]
Nitrous Ether.[2] Nitrites.[2]
Strychnine.[1]
Colchicum.[4]
Tobacco.[3]
Sugar of Milk.[1,4]

Stimulant Diuretics.
Alcohol.[2]
Blatta orientalis.[4]
Cantharides.[4]
Turpentine.[4]
Juniper.[4]
Savine.[4]
Capaiba.[4]
Cubeb.[4]
Cannabis.[4]
Capsicum.[4]
Buchu.[4]
Asparagus.[4]
Guaiac.[4]
Fennel.[4]
Urea.[4]
Uva Ursi.[4]
Zea.[4]

Diuretics are employed in medicine for certain definite purposes, as follows:—to remove fluid from the tissues and cavities of the body in cases of dropsy; to promote the elimination of waste-products and other poisons from the blood; to maintain the action of the kidneys; to dilute the urine, and to alter morbid conditions of that excretion.

In Dropsies from Cardiac Disease, or other dropsies due to venous congestion, the most efficient diuretics are those which act on the general vascular system, as Digitalis, Strophanthus, Squill, etc. Calomel is often very efficient in this form of dropsy, also Theobromine Sodio-Salicylate (Diuretin).

In Dropsy from Renal Disease, Diuretin, Broom-tops, Nitrous Ether, Oil of Juniper, Digitalis and Squill are the most reliable diuretics, in the order named.

In Ascites from Hepatic Cirrhosis, Copaiba is the best diuretic when the kidneys are healthy. In this form and the previous ones a little Pil. Hydrargyri given occasionally will often aid the diuretic action of the other agents.

To Eliminate Waste-products from the Blood, Potassium Nitrate and Bitartrate, Turpentine, Juniper, Caffeine, and Water in large quantity. [Compare LITHONTRIPTICS.]

To Dilute the Urine, Water is the best agent, its most efficient form being Distilled Water charged with Carbonic Acid gas.

As Adjuvants to Diuretics, when pressure on the uriniferous tubules or venous congestion prevent their action,—paracentesis abdominis, purgation, cupping over the loins, and even venesection, are often necessary to start the diuretic action.

The activity of the renal cells is directly depressed by the *Renal Depressants*, which thereby lessen or suspend the secretion of urine. Morphine, Quinine and Ergot act in this manner through their influence on the circulation. Instead of acting as a diuretic Digitalis may stop the secretion of urine, by so stimulating the vaso-motor centre as to greatly contract the renal vessels, and arrest the renal circulation (Brunton). This it might do if a preparation were used which was deficient in Digitoxin or Digitaleïn, the dilators of the renal arteries: (see under DIGITALIS.) The same is true of Caffeine and Strychnine, hence it is well to combine these with other diuretics which dilate the renal vessels, as the Nitrites, (Nitrous Ether, etc.), and Alcohol. Digitalis contains in itself the power of doing both these actions, and hence it is the ideal diuretic.

Emetics (ἐμέω, I vomit),—are agents which produce vomiting. They may be subdivided into two groups, *Local Emetics*, or those which act by irritating the end-organs of the gastric, pharyngeal or esophageal nerves, and *General or Systemic Emetics*, which act through the medium of the circulation. The members of both these groups produce emetic action by irritation of the vomiting centre in the medulla, the first by reflex, the second by direct stimulation. The principal emetics are the following named :—

Local Emetics.

Alum, Mustard, Salt.
Ammonium Carbonate.
Zinc and Copper Sulphates.
Subsulphate of Mercury.
Tepid Water, in quantity.
Vegetable Bitters, as Quassia, in strong infusions.

General Emetics.

Ipecacuanha. Emetine.
Apomorphine.
Tartar Emetic.
Veratrine.
Senega.
Squill.
Ouabaïn.

Tartar Emetic, *Ipecacuanha* and probably *Apomorphine*, act locally as well as systemically, for if injected subcutaneously they are excreted by the stomach in part, thus irritating the gastric nerves as well as the vomiting centre. *Pilocarpus* is a local emetic, and *Digitalis* and its congeners, also *Muscarine*, are systemic emetics, but none of these agents are used medicinally for that purpose. *Opium*, *Morphine* and *Codeine* usually produce emesis as one of their after effects.

Vomiting is an evacuant act which consists in compression of the stomach by the simultaneous spasmodic contraction of the diaphragm and abdominal muscles; also in relaxation of its cardiac orifice by contraction of the radiating muscular fibres in the gastric wall. If both acts occur at the same time, the contents of the stomach are expelled and vomiting occurs; if, however, the two acts do not take place simultaneously, the contents of the stomach are retained, and the abortive efforts are called *retching*. These acts are controlled and regulated by a nerve-centre in the medulla oblongata, which is closely connected with the respiratory centre, the muscular movements of vomiting being merely modified respiratory movements. This vomiting centre is ordinarily excited in two ways,—(1) by the peripheral stimulation of afferent nerves going to it from other parts of the body, (2) by impulses sent down to it from the brain (Brunton).

Nausea and vomiting are diminished by agents termed *Anti-emetics*, including gastric sedatives and general sedatives; some of which act by means of a local sedative influence upon the end-organs of the gastric nerves, others by reducing the irritability of the vomiting centre in the medulla. The act of vomiting being occasioned by irritation of afferent nerves from many regions of the body or impulses from the brain excited by impressions on the nerves of special sense, the measures and agents by which it may be combated are very diversified. [Compare the article entitled VOMITING, in Part III.] The most important anti-emetics are named in the following lists:—

Local Gastric Sedatives.

Alcohol.
Alum.
Arsenic.
Belladonna.
Bismuth.
Carbonic Acid.
Cerium Oxalate.
Chloroform.
Carbolic Acid.
Potassium Nitrate.
Creosote.
Ether.
Ice.
Opium.
Hydrocyanic Acid.
Silver Nitrate.
Calomel ⎫ small
Ipecac ⎭ doses.
Hot water.
Cocaine.

General Sedatives.

Opium.
  Morphine.
  Codeine.
Hydrocyanic Acid.
Bromides.
Chloral.
Nitro-glycerin.
Alcohol.
Amyl Nitrite.
Food.

Ice, swallowed in small pieces, is probably the most efficient of the local sedatives. *Carbolic Acid* and *Cocaine* are also effective anti-emetics, given in small doses by the mouth at short intervals. *Astringents* are very useful where there is congestion of the gastric mucous membrane, as in the vomiting of alcoholism and phthisis, when *Silver Nitrate* and *Alum* are especially to be recommended. *Opium* and its principal alkaloid, *Morphine*, will produce nausea and vomiting in many persons, even when given in very small doses.

Emmenagogues (ἔμμηνια, the menses, ἄγω, I move),—are remedies which restore the menstrual function, either directly by stimulation of the uterine muscular fibre, or indirectly by improving the blood and toning up the nervous system. Some of the direct emmenagogues are *oxytocic* in large doses. The principal members of this class are named in the following list:—

Direct Emmenagogues.

Ergot.
Savine.
Tansy. Rue.
Digitalis.
Cantharis.
Pulsatilla.
Asafetida.
Alcohol.
Indigo.
Hydrargyrum Biniodide.
Caulophyllum.
Apiol.
Borax.
Myrrh.
Guaiacum.
Polygonum Hydropip.
Potass. Permanganate.
Cimicifuga.
Oxalic Acid.
Hedeoma,
Origanum.
Viscum Flavescens.

Indirect Emmenagogues.

Iron.
Manganese.
Cinnamon.
Quinine.
Strychnine.
Aloetic Purgatives.
Cod-liver Oil.
Hot Hip-baths.
Leeching the genitals.
Rubefacients to thighs.
Tonic Remedies.

Emollients (*emollio*, I soften),—are substances which soften and relax the tissues to which they are applied. They relieve tension, dilate vessels, diminish pressure on the nerves, and protect inflamed surfaces from the air and from friction. The principal articles which may be classed under this heading are the following:—

Hot Fomentations.
Poultices.
Glycerin.
Lard.
Linseed Oil.
Olive Oil.
Spermaceti.
Almond Oil.
Petroleum.
Soap Liniment.
Starch.
Cacao Butter.

Errhines and Sternutatories (*ἕν*, in, *ῥίν*, the nose; *sternuto*, I sneeze),—are agents which produce increased nasal secretion and sneezing, when locally applied to the mucous membrane of the nose. The first term is usually applied to substances which cause increase of the mucus without sneezing, the latter to those which invariably produce sneezing. The drugs should be applied in powder. The stimulus produced by these agents is transmitted by the nasal branches of the fifth nerve to the respiratory centre, exciting the sudden and forcible expiratory effort called sneezing; also to the vaso-motor centre, contracting the smaller vessels throughout the body and producing a general rise in the blood-pressure. The principal agents of this class are—

Tobacco, as snuff.
Ipecacuanha.
Sanguinaria.
Veratrum Album.
Euphorbium.
Sassy Bark.
Saponine.
Ginger.
Capsicum.
Hellebore.
Ammonia.
Cubebs.

The last two named may be used as simple Errhines, as the vapor of dilute Ammonia-water or the smoke of burning Cubebs do not excite sneezing generally.

Escharotics or Caustics (*ἐσχάρα*, a slough or scab; *καὶω*, I burn),—are agents which destroy a tissue to which they are applied, and produce a slough. They may be divided into two classes, the *actual*, or those in which heat is the active agent, and the *potential*, by which a chemical process is called into play. Escharotics act usually in one of the following modes:—

1. By abstracting the water of the tissues.
2. By combining with the albumin of the tissues.
3. By corrosive deoxidation of the tissues.
4. By conversion of the tissues into carbon or gaseous bodies.

The principal escharotics are named in the following list, the numbers pointing out the mode of action as stated above:—

Mineral Acids.[1]
Glacial Acetic Acid.[1]
Carbolic Acid.[1]
Chromic Acid.[3]
Arsenous Acid.[1]
Antimony Chloride.[1]
Lime.[1]
Caustic Potash.[1]
Caustic Soda.[1]
Dried Alum.[2]
Silver Nitrate.[2]
Copper Sulphate.[2]
Zinc Sulphate.[2]
Zinc Chloride.[2]
Mercuric Chloride.[2]
Mercuric Oxide.[2]
Mercuric Nitrate.[2]
Bromine.[3]
High Heat.
- Cautery.[4]
- Moxa.[4]
- Boiling Water.[4]

Nitric Acid and *Zinc Chloride* are probably the safest and most generally useful of the potential caustics where any decided escharotic action is desired. *Silver Nitrate* is the best for superficial use, its action being limited to the part with which it comes in contact, and being stopped at once by the application of a solution of common salt. *Chromic Acid* is one of the most efficient escharotics, but it must be carefully used.

Expectorants (*ex*, out of, *pectus*, the breast),—are remedies which modify the secretion of the broncho-pulmonary mucous membrane, and promote its expulsion. They may be divided into the following groups:

Nauseating Expectorants in large doses act mechanically by expelling the mucus in the act of vomiting, in small doses by increasing osmosis from the inflamed mucous membrane. The members of this subdivision generally increase secretion and tend to lower the blood-pressure. The chief ones are the following named:—

Antimony, Tartar Emetic.
Ipecacuanha, Emetine.
Pilocarpus (Jaborandi).
Apomorphine.
Quebracho.
Alkalies.
Potassium Iodide.
Lobelia.
  Lobeline.

Stimulant Expectorants are largely eliminated by the bronchial mucous membrane, which they stimulate, altering the secretion and facilitating expectoration. These remedies generally diminish secretion and increase blood-pressure. This subdivision includes the following named:—

Ammonium Chloride.
Ammonium Carbonate.
Benzoin and Benzoic Acid.
Balsams of Peru and Tolu.
Wood Tar, and Tar.
Oleum Pini Sylvestris.
Acids.
Squill.
Garlic.
Onion.
Turpentine.
Sulphur.
Nux Vomica.
  Strychnine.
Senega.
  Saponine.
Liquorice.
Saccharine Substances.

Besides the above many other remedies may act as expectorants, some by relieving bronchial spasm, as Opium, Stramonium and Tobacco; others by soothing the irritable respiratory centre, as Opium and Chloral; and the ciliary excitants by reflex action through their impression on the nerves of the mouth.

Galactagogues (*γάλα*, milk, *ἄγω*, I bring away),—are agents which are supposed to increase the lacteal secretion. The value of most of them is very doubtful, probably the only efficient one being *Pilocarpus* (Jaborandi), but its influence is very transient and the excessive perspiration and salivation caused by it are objectionable. The leaves of *Ricinus communis*, the castor-oil plant, locally applied, have been highly recommended; but general measures are more trustworthy, such as the correction of anemia, attention to sore nipples, administration of tonics and good food. [Compare the article entitled LACTATION in Part III.] Other agents reputed to have galactagogue properties are the following-named:—

Anise.
Dill.
Fennel.
Vanilla.
Gallega.
Physostigma.
Strychnine.
Potassium Chlorate.
Beer, Ale, Porter.
Black Tea.
Sinapisms.
Electricity.

Galactophyga (γάλα, milk, φεύγω, I shun),—are agents and measures which diminish or arrest the secretion of milk. *Belladonna* or its alkaloid *Atropine* is the most efficient, acting whether applied locally or administered internally. *Antipyrin* has similar power, so also has Camphor applied locally and Potassium Iodide, Colchicum with Magnesium Sulphate, Tobacco, Sage, Quinine, Tannin, etc. Compression of the breasts, by bandaging or strapping with adhesive plaster, has positive antigalactic action.

Hearing is affected by several drugs. *Strychnine* and *Morphine* increase the excitability of either the auditory nerve or the centre for hearing in the superior temporo-sphenoidal convolution, making that faculty much more acute. *Quinine*, *Antipyrin* and *Salicylates* produce hyperemia of the auditory apparatus, causing subjective noises, as humming, buzzing, or ringing, which are very unpleasant. Hydrobromic Acid and the Bromides, also Ergot, will diminish the congestion and thus neutralize or prevent these noises to a great extent.

Quinine in large doses is believed by some to have produced permanent injury of the sight and the hearing, but authentic cases of such action are extremely rare, if indeed they can be found at all. Temporary deafness is often caused by Quinine, but it usually disappears soon after the administration of the drug is stopped.

Hepatic Depressants lower the functional activity of the liver, some reducing the secretion of bile, others lessening the production of glycogen, and others diminishing the production of urea. *Lead Acetate* is a direct hepatic depressant, especially in large doses, and is probably the only drug which lessens the biliary secretion without causing purgation. Many *Purgatives* diminish the secretion of bile by lowering the [illegible] in the liver and by carrying off material from which bile [illegible] The list of hepatic depressants includes the following-

Lessening Bile.	*Diminishing Glycogen.*	*Lessening Urea.*
Lead Acetate.	Opium.	Opium.
Atropine.	Morphine.	Morphine.
Calomel.	Codeine.	Codeine.
Chloral.	Arsenic.	Alcohol.
Castor Oil.	Antimony.	Colchicum.
Gamboge.	Phosphorus.	Quinine.
Magnesium Sulphate.		

Contrary to the generally accepted opinion, *Opium* and *Morphine* do not affect the biliary secretion (Murrell).

Hepatic Stimulants and Cholagogues (χολή, bile, ἄγω, I bring away),—are two groups of agents acting upon the biliary secretion, the first-named increasing the functional activity of the liver-cells and the amount of bile formed, the second removing the bile from the duodenum and preventing its reabsorption into the portal circulation. Some hepatic stimulants are also cholagogues, others are not, while cholagogues proper generally act indirectly as hepatic stimulants by carrying off the bile and thereby urging the liver to secrete more. The discovery of the entero-hepatic circulation of bile has cleared up many of the discrepancies formerly existing with regard to the action of drugs upon this gland and its secretion, yet neither this subject nor hepatic chemistry has yet attained such results as would enable us to formulate positive doctrines thereon. *Bile, Bile Salts and Sodium Salicylate* are at present the only agents which have been experimentally proven to have the direct power of increasing the biliary secretion, though a number of drugs are believed to act in this manner upon clinical and other evidence. The following list includes the principal agents which are generally credited with the actions defined above:—

Hepatic Stimulants.		*Cholagogues.*
Bile, Bile Salts.	Ipecacuanha.	Mercury with Chalk.
Sodium Salicylate.	Colocynth.	Calomel.
Nitro-hydrochloric Acid.	Colchicum.	Pil. Hydrargyri.
Corrosive Sublimate.	Podophyllin.	Sodium Phosphate.
Mineral Acids.	Euonymin.	Sodium Sulphate.
Arsenic.	Iridin.	Potassium Sulphate.
Sulphurated Antimony.	Aloes.	Aloes.
Benzoic Acid.	Jalapin.	Podophyllin.
Sodium Benzoate.	Scammony.	Colchicum.
Sodium Phosphate.	Rhubarb.	Colocynth.
Sodium Sulphate.	Sanguinarine.	Rhubarb.
Sodium Sulphocarbolate.	Hydrastin.	Jalapin.

To secure the best cholagogue effect it is advisable to combine an hepatic stimulant with an intestinal stimulant which shall produce increased secretion from the intestinal mucous membrane and excite peristalsis. *Hydrochloric Acid* which has been kept long and has become a light or golden-yellow color, is relatively inert as an hepatic stimulant, but the freshly combined, deep red acid is active and valuable (Wood).

The glycogenic function of the liver, and the production of urea are stimulated by the following-named drugs:—

Increasing Glycogen.
Amyl Nitrite.
Sodium Bicarbonate.
Nitro-hydrochloric Acid.

Increasing Urea.
Arsenic.
Antimony.
Ammonium Chloride.
Iron.
Phosphorus.

Hypnotics (ὕπνος, sleep),—are remedies which produce sleep. In this wide sense the term includes the narcotics and the general anesthetics, but it is usually restricted to those agents which, in the doses necessary to cause sleep, do not disturb the normal relationship of the mental faculties to the external world (Brunton). Another definition of hypnotics is—that they produce sleep without suspending the consciousness of pain, narcotics doing both. Hypnotics may be subdivided into the following classes :—

(*a*) *Pure Hypnotics*,—which directly induce a sleep closely resembling the normal, without causing narcotic or other dangerous cerebral symptoms. The *Bromides* are the type of this subdivision, but the list is constantly growing smaller as experience reveals toxic powers in the action of its members.

(*b*) *Narco-hypnotics*,—which induce sleep by direct depression of the cerebral functions and in larger doses are narcotic, suspending the consciousness of pain and producing coma. *Opium* is the type of this class.

(*c*) *Indirect Hypnotics*,—which induce sleep by removing or suppressing any cause (not mental) which interferes therewith. Such are the non-narcotic analgesics,* acting against pain; the respiratory stimulants,† relieving dyspnea; the pulmonary sedatives,‡ relieving cough; the motor depressants,§ restraining excessive motor activity; also the vascular and cardiac tonics,¶ antagonizing cerebral hyperemia and regulating the cardiac action.

The principal members of each of the above subdivisions are named in the following lists :—

Pure Hypnotics.
Potassium Bromide.
Sodium Bromide.
Paraldehyde.
Sulphonal.
Trional.
Tetronal.
Urethane.
Chloralamid.

Narco-hypnotics.
Chloral Hydrate.
Opium, Morphine, Narceine.
Hyoscine. Duboisine.
Cannabis Indica.
Pellotine.
Passiflora Incarnata.
Piscidia Erythrina.
Amylene Hydrate.
Alcohol.

Indirect Hypnotics.
*Antipyrin.
*Acetanilid.
*Phenacetin.
†Strychnine.
‡Hydrocyanic Acid.
§Conium.
§Gelsemium.
¶Ergot.
¶Digitalis.

Chloral Hydrate is undoubtedly the most efficient of all hypnotics. *Paraldehyde* is one of the most reliable and safe, but its sleep is transient, lasting only a few hours. *Sulphonal* and *Trional* are very efficient in some cases, but often fail entirely. *Urethane* is feeble and uncertain, and the same may be said of *Humulus* and some other agents which are not mentioned above. *Piscidia* is also somewhat uncertain in action, though its hypnotic and anodyne powers have proved very decided in many cases.

Dr. Wilcox rejects the dangerous, unreliable and objectionable hypnotics, and retains four as amply sufficient for all ordinary cases of insomnia. These he classifies as follows :—

As to Potency: Paraldehyde, Chloralamide, Pellotine, Trional.
As to Rapidity: Pellotine, Paraldehyde, Chloralamide, Trional.
As to Freedom from causing Habituation: Pellotine (slight), Trional, Chloralamide, Paraldehyde (considerable).
As to Safety: Chloralamide, Pellotine, Paraldehyde, Trional.

Intestinal Astringents contract the walls of the intestinal vessels, diminishing the exudation therefrom, and lessening the fluidity of the fecal discharges. The more powerful members of this group have also a constringing action on the intestinal mucous membrane. The principal agents of this class are named in the following lists:—

Astringents.
Phosphoric Acid. } Diluted.
Nitric Acid. } Diluted.
Sulphuric Acid. } Diluted.
Acetic Acid. } Diluted.
Lead Acetate.
Silver Nitrate.

Constringents.
Tannic Acid.
Vegetable Astringents.
Alum.
Zinc Oxide.
Copper Sulphate.
Persalts of Iron.

Irritants are substances which, when applied to the skin, produce a greater or less degree of vascular excitement. When used to produce a reflex influence on a part remote from their site, they are termed counter-irritants. They may be subdivided into the following groups:—

(*a*) *Rubefacients*, are those which produce temporary redness and congestion of the skin, unless left too long in contact with the surface, when they may cause exudation between the cuticle and the true skin (vesicants), or may destroy the tissue and form a slough (escharotics). They may also induce muscular atrophy.

(*b*) *Vesicants, Epispastics or Blisters*, are those which cause decided inflammation of the skin and the outpouring of serum between the epidermis and the derma. *Cantharides* is the agent generally used for blistering purposes.

(*c*) *Pustulants*, affecting isolated parts of the skin, namely—the orifices of the sweat-glands, giving rise to pustules.

The following list includes the principal agents and measures belonging to these three groups:—

Rubefacients.
Mustard.
Capsicum.
Camphor.
Ammonia.
Mezereon.
Arnica.
Alcohol.
Ether.
Chloroform.
Iodine.
Menthol.

Rubefacients.
Oil of Cajuput.
Oil of Turpentine.
Volatile Oils.
Pitch.
Friction.
Hot Water.

Pustulants.
Croton Oil.
Tartar Emetic.
Ipecacuanha.
Silver Nitrate.

Vesicants.
Cantharides.
Euphorbium.
Mezereon.
Iodine.
Rhus Toxicodendron.
Ammonia (the confined vapor).
Glacial Acetic Acid.
Volatile Oil of Mustard.
Heat. { Boiling Water.
Heat. { Corrigan's Hammer.

Lithontriptics and Antilithics (λίθος, a stone, τρίβω, I wear down),—are agents which are supposed to promote the solution of concretions in the excretory passages (lithontriptics) or to prevent their formation (antilithics). These terms are generally restricted to remedies affecting the urinary calculi, but those directed against the biliary form are included in this arrangement for the sake of consistent classification. The chief agents coming under these titles are the following-named:—

Biliary Calculi.
- Ether and Turpentine. (Durande's Solvent.)
- Sodium Bicarbonate.
- Sodium Salicylate.
- Sodium Phosphate.
- Castile Soap.
- Alkaline Waters, especially Vichy.

Uric Acid Calculi.
- Distilled Water.
- Potassium Salts.
- Lithium Salts.
- Magnesium Citroborate.
- Piperazin.
- Lysidin.
- Lycetol.

Calcium Oxalate Calculi.
- Dilute Nitro-hydrochloric Acid.
- Carbonated Water.
- Lactic Acid (for digestion).

Phosphatic Calculi.
- Ammonium Benzoate.
- Benzoic Acid.
- Dilute Nitric Acid.

There is probably little or no solvent value to the agents recommended for biliary calculi. In the case of uric acid calculi the administration of *Potassium* or *Lithium Salts* is based on their power of combining with the acid in the calculus, thus forming urate of potassium or of lithium, which salts are more soluble than uric acid itself. *Piperazin* is still more efficient in this respect, forming a piperazin urate which is seven times more soluble than lithium urate. *Lysidin* is still more powerful.

Motor Depressants lower the functional activity of the spinal cord and other parts of the motor apparatus and in large doses paralyze them. Drugs which depress the cerebral motor convolutions, the motor centres in the medulla, the motor nerve-trunks and nerve-endings, or the muscular contractility itself, produce impairment of the motor power, and in large doses may cause complete paralysis of the part or parts involved. Some act indirectly by reducing the spinal circulation, as Aconite, Digitalis and large doses of Quinine, others by a direct paralyzant action on the centres. The principal members of this class are named in the following list:—

- Curare.
- Physostigma.
- Conium.
- Gelsemium.
- Opium, Morphine, Apomorphine.
- Belladonna, Atropine.
- Stramonium.
- Hyoscyamus.
- Muscarine.
- Pulsatilla.
- Grindelia.
- Phytolacca.
- Pilocarpus.
- Quebracho.
- Aconite.
- Veratrum.
- Tobacco.
- Lobelia.
- Digitalis.
- Arnica.
- Ailanthus.
- Saponin.
- Sparteine.
- Ergot (at last).
- Quinine (large doses).
- Camphor.
- Alcohol (large doses).
- Ether (large doses).
- Chloroform (large).
- Chloral.
- Bromides.
- Potassium Salts.
- Many metallic Salts.
- Amyl Nitrite.
- Nitroglycerin.
- Hydrocyanic Acid.
- Potassium Cyanide.
- Methyl-strychnine.
- Many Methyl compounds.
- Ammonium Cyanide.
- Ammonium Iodide.
- Many compound Ammonias.
- Galvanism.
- Cold.

The motor centres in the medulla are powerfully depressed by Opium, Morphine, Aconite, Conium, Chloral, Physostigma, and large doses of Alcohol, Ether and Chloroform. These last three are also paralyzers of the *motor convolutions in the brain*, arresting all voluntary movements when administered in sufficient quantity. *The anterior cornua of the cord* are greatly depressed by Physostigma, Carbolic Acid, and other agents, and the *motor nerves* by Conium, Methyl-strychnine, etc., both actions resulting in paralysis of the limbs. Curare, even in small doses, paralyzes the end-organs of the motor nerves, and Belladonna, the compound Ammonias, Methyl-compounds, etc., exercise a similar but less powerful influence. Galvanism is also an effective local depressant of motor activity.

Motor-Excitants are agents which increase the functional activity of the spinal cord and the motor apparatus, producing disturbances of motility, heightened reflex excitability, and tetanic convulsions when given in large doses, their ultimate effect being motor paralysis from over-stimulation.

The most important members of this class are Nux Vomica and Ignatia, with their alkaloids Strychnine and Brucine, also Thebaine, the tetanizing alkaloid of Opium. The group also includes Morphine and Atropine, which, though at first sedative, when given in large doses produce convulsions. *The respiratory centre* in the medulla is stimulated by Strychnine, Atropine, Ammonia, and small doses of Alcohol, Ether and Chloroform. *The motor convolutions* in the brain are stimulated by Alcohol in moderate doses, also for a brief period by Ether and Chloroform. *The end-organs of the motor nerves* are stimulated by the local use of Electricity, Strychnine and friction; and are irritated by the internal administration of Aconitine, Nicotine, Camphor, Pilocarpine and Pyridine. Other members of this class are named in the following list:—

Nux Vomica.
Ignatia.
Strychnine.
Brucine.
Thebaine.
Morphine (large dose).
Atropine (large dose).
Alcohol (small dose).
Ether (small dose).
Chloroform (small dose).
Ammonia.
Absinthe.
Buxine.
Calabarine.
Ergot.
Ustilago.
Gossypium.
Picrotoxin.
Aconitine.
Nicotine.
Camphor.
Digitalis.
Convallaria.
Cimicifuga.
Pilocarpine.
Pyridine.
Rhus Toxicodendron.
Electricity.

Mydriatics (μυδρίασις, mydriasis),—are agents which produce dilatation of the pupil of the eye (mydriasis). Some act locally, others when given internally, but the principal ones (*Atropine* and its congeners) act both locally and internally, producing at the same time paralysis of the ciliary muscle, resulting in temporary loss of accommodation, the eye remaining focussed for distant objects, and the intra-ocular tension being increased. The principal mydriatics are the following-named:—

Atropine.
Belladonnine (internally only).
Hyoscyamine.
Daturine.
Duboisine.
Homatropine.
Gelsemine (locally only).
Muscarine.
Cocaine.
Anesthetics (at last).

The dilating action of *Atropine* and its congeners is due to stimulation of the end-organs of the sympathetic nerve, increasing the power of the radiating muscular fibres of the iris, and also to paralysis of the end-organs of the motor oculi (3d cranial) nerve, lessening the power of the circular fibres or sphincter iridis. When administered internally the drug is carried by the circulation to the eye, acting thereon locally as if instilled directly upon the conjunctiva. *Cocaine* acts by stimulating the terminations of the sympathetic. *Anesthetics* produce mydriasis late in their action, which is central. Atropine, Duboisine and Homatropine are the mydriatics chiefly used by ophthalmologists.

Myotics (μύω, I close),—are agents which produce contraction of the pupil. The alkaloid *Physostigmine* (Eserine) is the chief local myotic, and the only one used in ophthalmic practice. It acts by stimulating the circular muscular fibres of the iris, at the same time contracting the ciliary muscle so that the eye is accommodated for near objects only, also diminishing intra-ocular tension; in all of which it exactly antagonizes the action of Atropine.

Muscarine, Pilocarpine and Nicotine are also local myotics, acting upon the end-organs of the oculo-motor nerve. Anesthetics in the early stage of their action cause contraction of the pupil by lessening reflex action; later, when they begin to paralyze respiration, the accumulation of venous blood irritates the centres and produces dilatation, which during anesthesia is a sign of failing respiratory power. The myotic action of *Opium* is of central origin, probably paralysis of local reflex excitability. The chief myotics are—

Physostigma, Eserine.
Opium, Morphine.
Pilocarpus, Pilocarpine.
Muscarine.
Gelsemine (internally).
Carbolic Acid (internally).
Lobeline (internally).
Nicotine (locally).
Anesthetics (at first).

Narcotics (νάρκη, stupor), are agents which lessen the relationship of the individual to the external world. At first more or less excitant to the higher brain and stimulant to the mind and to all the bodily functions, the next stage of their action is one of profound sleep characterized by increasing stupor, and this, if the dose has been sufficient, is followed by coma and insensibility (narcotism), and finally death occurs from paralysis of the medullary centres which govern respiration and the other functions of organic life. Narcotics and stimulants are closely related, Alcohol and Opium affording good illustrations, in the different stages of their action, of stimulation followed by narcosis. Narcotics, in proper medicinal doses, give us the power of lowering morbidly acute perception, of relieving pain and allaying irritation, nervous agitation and spasm, of inducing sleep, and of regulating the vital functions by rest—all of which are means of great therapeutical value. The chief narcotics are:—

Opium, Morphine.
Belladonna, Atropine.
Hyoscyamus.
Stramonium.
Cannabis Indica.
Alcohol.
Ether.
Chloroform.
Chloral Hydrate.
Bromal Hydrate.
Carbolic Acid.
Hydrocyanic Acid.
Oil of Turpentine.
Other Essential Oils.
Carbonic Acid Gas.

Opium is the typical member of the group. *Humulus* (hops) and *Lactucarium* (lettuce) are generally included among the narcotics, but their action is so feeble that they are seldom used for such purpose.

Oxytocics or Ecbolics (ὀξύς, quick, τόκος, childbirth; ἐκβολή, abortion),—are agents which stimulate the muscular fibres of the gravid uterus to contraction, and may therefore produce abortion. In small doses the same remedies are emmenagogue as a rule. Their mode of action has not been clearly made known, but it is generally believed to be due in some cases to direct stimulation of the uterine centre in the cord, in others to congestion of the uterus producing reflex stimulation. The principal oxytocics are those named in the following list:—

Ergot.
Ustilago.
Savine.
Potassium Permanganate.
Hydrastis.
Borax.
Cotton-root Bark.
Oil of Rue.
Pilocarpine.
Viscum Flavescens.
Strong Purgatives.

Any drastic purgative, or gastro-intestinal irritant, may produce abortion by reflex action. The *Volatile Oils* act in this manner, also *Colocynth* and many other agents used by women to produce abortion, as *Tansy*, *Pennyroyal*, *etc.*, all of which are dangerous to life in doses sufficient to excite the action of the gravid uterus.

According to Boissard there are no abortifacient drugs in the strict sense of the term, though some drugs given in toxic doses may cause abortion and the death of the woman. Such drugs are therefore useless in any except the most reckless hands. The oxytocic and ecbolic drugs belong to another class, having the power of strengthening the intensity of the uterine contractions after they have been aroused (oxytocics), or of arousing and aiding uterine contractility (ecbolics). The action of the former is certain, that of the latter is very doubtful.

Pancreatic Stimulation may be obtained by the administration of *Ether*, or by galvanism of the gland itself. The secretion is depressed by *Atropine*, also by any agent inducing nausea and vomiting.

Parasiticides (*παρασίτος*, a parasite, *cædo*, I kill),—are agents which destroy the animal and vegetable parasites found upon the human body. They are generally applied in the form of lotions, ointments or oleates, and include the following-named substances:—

Sulphur.
Sulphides.
Sulphurous Acid.
Sulphur Iodide.
Iodine.
Mercury.
Ammoniated Mercury.
Mercuric Chloride.
Mercuric Nitrate.
Mercuric Oxide.
Carbolic Acid.
Petroleum.
Storax.
Staphisagria.
Balsam of Peru.

Protectives are agents of a mechanical nature employed to cover and protect an injured part from the air, water, friction, etc. *Collodion* and *Gutta-percha* are those in general use, but certain plasters, as the adhesive, the lead or the soap plaster, may be employed for this purpose, also cotton.

Pulmonary Sedatives diminish cough and dyspnea by lessening the irritability of the respiratory centre or that of the nerves of respiration. Some act by directly depressing the respiratory centre; others by removing some irritant from the passages, or by lessening local congestion, as the expectorant group; and others by lowering the excitability of the vagus end-organs in the lungs and that of other afferent filaments throughout the respiratory tract. The principal pulmonary sedatives are named in the following list:—

Opium.
  Morphine. Codeine.
Belladonna.
Stramonium.
Hyoscyamus.

Hydrocyanic Acid.
Potassium Cyanide.
Amyl Nitrite.
Quebracho.
Cannabis.

Turpentine.
Ethyl Iodide.
Conium.
Tobacco.
Lobelia.

Opium has the most powerful influence as a sedative to the respiratory centre, and mucilaginous or saccharine substances soothe the local irritation, hence the latter are so frequently used as vehicles for the former in cough mixtures. *Hydrocyanic Acid* has a similar sedative action, hence the use of Prunus Virginiana and other substances containing it against cough. *Belladonna* stimulates the respiratory centre, but at the same time lessens the excitability of the vagus terminations in the lungs, and completely arrests secretion from the bronchi. *Stramonium* acts similarly.

Refrigerants (*refrigero*, I cool),—are remedies which allay thirst and impart a sensation of coolness. They include the Vegetable Acids, the Mineral Acids (greatly diluted), Ice, Water if cold, effervescing drinks, fruit juices, and many diaphoretics.

Respiratory Depressants lower the activity of the respiratory centre, rendering the respirations slow and shallow. The chief agents of this class are:—

Cold.
Opium.
Physostigma.
Muscarine.
Lobeline.

Gelsemium.
Aconite.
Veratrine.
Hydrocyanic Acid.
Conium.

Alcohol.
Ether.
Chloroform.
Chloral.
Saponin.

Caffeine.
Colchicine.
Nicotine.
Quinine.
Camphor.
Carbolic Acid.

The eleven last named first excite the centre for a brief period and then depress it.

Respiratory Stimulants exalt the function of the respiratory centre, quickening and deepening the breathing. Such agents are:—

Strychnine.
Brucine.
Atropine.
Duboisine.
Emetine.
Chloralamid.

Opium (small doses).
  Thebaine.
Apomorphine.
Ammonia.
Hydrocyanic Acid.
Digitalis.

Quebracho.
Zinc and Copper Salts.
Tobacco (briefly).
Alcohol (briefly).
Ether (briefly).
Cold Douche.

Strychnine also stimulates the vagus tract. *Electricity*, applied to the nerve-trunks or to the inspiratory muscles, is a direct respiratory stimulant. *Veratrine*, *Eserine* and *Muscarine* stimulate the vagus terminations, quickening the respiration, but afterwards slow it by depressing the respiratory centre. *Aconite* stimulates the end-organs of the vagus when given in small doses.

The Respiratory Centre is situated in the medulla oblongata, close to the termination of the calamus scriptorius. It probably consists of thoracic and diaphragmatic *Inspiratory Centres*, the act of expiration being considered normally a passive one, due to the natural contraction of the walls of the air-vesicles, and the return of the diaphragm and thoracic walls to the position from which they were moved by the inspiratory effort. An *Expiratory Centre* must also exist for the initiation of forced expiration, as in the production of voice, cough, sneezing, etc. The chief *Inspiratory Nerves* are the pulmonary ranches of the vagus. *The Expiratory Nerves* are the nasal branches of the fifth, the perior and inferior laryngeal, and the cutaneous nerves of the chest and abdomen.

Restoratives are agents which promote constructive metamorphosis, including the Foods, Hematics and Tonics, as well as many agents called Stimulants in other classifications.

Foods, are substances which, when introduced into the body, supply material to renew some structure or to maintain some vital process; being distinguished from medicines in that the latter modify some vital action but supply no material to sustain such.

The food of man is derived from all three of the kingdoms of nature, the animal, vegetable, and mineral, and includes many substances treated of in the Materia Medica, as Oils and Fats, Sugar, Starch, Gum, Alcohol, Beverages like Coffee and Tea, Water, Phosphate of Lime, Sodium Chloride, etc.

Hematics (αἷμα, the blood), are medicines which augment the quantity of hematin in the blood, and thus restore the quality of that tissue by enriching its red corpuscles. They consist chiefly of Iron and Manganese and their compounds.

Tonics (τόνος, tension), are agents which improve the tone of the tissues on which they have specific action, restoring energy and strength to debilitated subjects by a scarcely perceptible stimulation of all the vital functions, their effects being apparent in an increased vigor of the entire system. The chief tonics are enumerated in the foregoing lists under the heads of the organs or tissues particularly affected by them. [Compare the articles entitled STIMULANTS, RESPIRATORY STIMULANTS, CARDIAC TONICS, VASCULAR TONICS, GASTRIC TONICS, etc.]

The most typical medicinal agents which impart *general tone and strength* are Strychnine, Quinine, Iron and Vegetable Bitters. Those specially acting upon the *stomach*, are Arsenic, Bismuth, Cinchona, Hydrastis and Nux Vomica,—on the *spinal cord* and general circulation, Strychnine,—on the *heart*, Digitalis, Squill, Convallaria and Cimicifuga,—on the *nervous system*, Phosphorus, Quinine and the Valerianates,—on *muscular tissue*, Tannin,—on the *blood*, Iron, Manganese, Cod-liver Oil, and other fats.

Sedatives (*sedo*, I allay),—are agents which exert a soothing influence on the system by lessening functional activity, depressing motility and diminishing pain.

General Sedatives include the narcotics and anesthetics. *Local Sedatives* include Aconite, Opium, Ice, etc. *Pulmonary Sedatives*, as Hydrocyanic Acid, Veratrine and the nauseants and emetics. *Spinal Sedatives*, as Physostigma, Gelsemium, Potassium Bromide. *Stomachic Sedatives* include Arsenic, Bismuth, Silver Nitrate, Sodium Bicarbonate. *Vascular Sedatives*, as Digitalis, Tobacco, Aconite, Veratrum, and the emetics. *Nervous Sedatives*, among which are Potassium Bromide, Tobacco, Lobelia, and the group of spinal depressants.

Sialogogues (σίαλον, saliva, ἄγω, I carry off),—are agents which increase the secretion and flow of saliva and buccal mucus, either by reflex action from the local irritation produced when anything is taken into the mouth, or by stimulating the glands during their elimination. The principal sialogogues are divided into two groups, the first or *topical* *sialogogues* acting by reflex stimulation; the second, *general sialogogues*, acting through their systemic influence on the glands or their secretory nerves; and include the following-named substances:

Topical Sialogogues.	*General Sialogogues.*
Acids and Alkalies.	Pilocarpus (Jaborandi).
Ether, Chloroform, etc.	Muscarine.
Mustard. Ginger.	Physostigma.
Pyrethrum. Mezereon.	Mercurials.
Tobacco. Cubebs.	Iodine compounds.
Capsicum. Rhubarb.	Antimonials.
Horse-radish.	Tobacco. Ipecacuanha.

Agents which diminish salivary secretion are termed *Antisialics*. The principal member of this group is *Atropine*, which paralyzes the terminals of the nerves of secretion. *Physostigma* counteracts this paralysis, but in large doses acts also as an antisialic by lessening the blood supply to the glands. *Opium* diminishes the reflex excitability of the reflex centre and also lessens the secretion directly. Others acting locally are—

Borax.
Potassium Chlorate.
Soda.
Lime.
Lithia.
Magnesia.
Insipid or nauseous articles of food or medicine.

Smell is one of the senses which is increased by *Strychnine*. It is decreased by all cerebral depressants and by those agents which produce changes in the nasal mucous membrane, as *Potassium Iodide*.

The cerebral centre for this faculty is situated at the tip of the temporo-sphenoidal lobe, and the terminal branches of the olfactory nerve are distributed upon the mucous lining of the upper portion of the nasal fossæ. Strychnine probably stimulates the former, and all drugs acting upon the latter region have more or less effect upon the power of distinguishing smells.

Stimulant (*stimulus*, a goad),—is a term which is used in various senses when applied to medicinal agents. Alcoholic preparations, which are true narcotics, are commonly termed "stimulants," and the same expression is employed to designate any agent which excites even briefly the organic action of any part of the system. All excessive stimulation reacts into depression, and most of the agents which stimulate the nerve centres at first will soon depress and finally paralyze them. In many cases the action is one of progressive stimulation primarily and progressive paralysis afterwards, affecting the centres in the inverse order of their development, the highest or latest developed centres being affected first, the lowest or oldest ones last. These laws are well exemplified in the action of Alcohol upon the nervous system. [Compare the article entitled ALCOHOL in Part I.]

Diffusible Stimulants are those which have a prompt but transient effect on the general system, such as Alcohol, Ammonia, Camphor, etc. *Spinal Stimulants* exalt the functions of the cord, as Strychnine, Picrotoxin, Ergot, Atropine, Phosphorus. *Cardiac Stimu-*

lants increase the action of the heart, as Alcohol, Atropine and Morphine in small doses, Strychnine, etc., also Squill, Convallaria, Cimicifuga and Digitalis, which slow but strengthen the cardiac action. *Respiratory Stimulants* directly stimulate the respiratory centre, as Ammonia, Strychnine, Apomorphine, Belladonna, etc. *Vaso-motor Stimulants*, as Alcohol, Chloroform, Ether (all three in very small quantities), Ammonia, Strychnine, Digitalis and Squill, acting on the vaso-motor centre; and the Nitrites, Belladonna, Electricity, Volatile Oils, etc., acting as local dilators of the vascular system. *Cerebral Stimulants*, as Alcohol, Opium, Belladonna, Caffeine, Cocaine, Theine, Cannabis, Chloroform, Ether, Tobacco. etc. *Renal Stimulants*, as the diuretic group. *Stomachic Stimulants*, as the Aromatics, Volatile Oils, Vegetable Bitters, Mineral Acids, Nux Vomica, Mustard, Capsicum, etc. *Hepatic Stimulants*, as Nitro-muriatic and Nitric acids, and the cholagogue purgatives Podophyllum, Jalap, Leptandra, Euonymin, Iridin, etc. *Intestinal Stimulants*, as Mercurials, Elaterium, Colocynth, Jalap, Scammony, Podophyllum, etc., which affect the glandular apparatus,—and Belladonna, Physostigma, Nux Vomica, Rhubarb, Senna, Aloes, Frangula, Cascara, etc., which chiefly affect the muscular fibres and the intestinal nerves. *Cutaneous Stimulants*, as the diaphoretic group, and the rubefacients Mustard, Capsicum, Turpentine, Ammonia, etc.

Local Stimulants increase common sensibility to the extent of producing pain, chiefly by direct action upon the end-organs of the sensory nerves in the skin, though some act probably by stimulating the local circulation, as in inflammation. The principal members of this subdivision are—

Faradism.
Heat.
Cold.
Alcohol.
Ether.
Chloroform.
Carbolic Acid.
Creosote.
Mineral Acids.
Ammonia.
Volatile Oils.
Acrid Essential Oils.
Metallic Salts.
Veratrine (at first).
Cantharis (at first).

Stomachics or Gastric Tonics are agents which increase the appetite and promote gastric digestion. They include a number of substances, dietetic and medicinal, some acting by stimulating the production of gastric juice, others by stimulating the local circulation, and several by exciting the activity of the nervo-muscular apparatus of the stomach. The first indication is met by the use of dilute alkaline solutions before meals,—the second by administering any of the pungent carminatives, as the Aromatic Oils, Pepper, Mustard, etc., or by Alcohol and Ether in small doses, or by the Aromatic Bitters, as Gentian, Orange, etc., or the simple bitters, as Calumba;—while the third desideratum is secured by the use of such agents as Nux Vomica, Hydrastis, Arsenic, the dilute Mineral Acids and the Volatile Oils.

Adjuvants to digestion are the digestion-ferments, Pepsin, Ingluvin, Papain, and also dilute HCl acid; all of which may be used to supplement the gastric juice when deficient in quantity or quality. The juice of the *Pineapple* contains a very active digestive principle, and may be employed as an aid to digestion with excellent results. *Pepsin* acts in acid media, and is only applicable to gastric indigestion; *Pancreatin* acts in alkaline media, is destroyed by acids, and is only applicable to intestinal indigestion; while *Papain* exercises its proteolytic power in either acid, alkaline or neutral solutions, and is equally applicable to either gastric or intestinal indigestion.

Styptics and Hemostatics (*στύφω*, I contract, *αἷμα*, blood, *στάσις*, a standing),—are agents which arrest bleeding; *Styptics* being those which are applied locally, and *Hemostatics* those which are administered internally. Some of the former act mechanically, by promoting the formation of a clot in the mouths of the bleeding vessels; others cause the vessels themselves to contract, thereby checking the flow of blood. The principal members of this class are the following-named:—

Styptics.

Acids.
Alum.
Antipyrin.
Collodion. Gelatin.
Ferric Chloride.
Ferric Sulphate.
Silver Nitrate.
Adrenal Extract.
Matico.
Spider's-web.
Tannic Acid.
Lead Acetate.
Zinc Sulphate.
Vegetable Astringents.
Cold (locally).
Cauterization.

Hemostatics.

Ergot. Digitalis.
Gallic Acid. Matico.
Lead Acetate.
Dilute Sulphuric Acid.
Ipecacuanha.
Hamamelis.
Oil of Turpentine.
Heat (locally).

Taste is not much affected by drugs except as each drug makes its own peculiar impression on the nerves of taste, and may overcome that of another agent. Smell has much to do with taste in many instances, the expedient of holding the nose while swallowing Castor Oil being familiar to every one.

The "after-taste" of drugs is often different to their original taste; thus *Bitters* are said to leave a sweet after-taste, and the same is claimed for *Quinine* if given in acid solution so as to be entirely dissolved, and if washed out of the mouth with water immediately after swallowing. Substances which are excreted from the system in the saliva (as Iodides) leave a very persistent after-taste.

Urinary Acidifiers include Benzoic and Salicylic Acids and several of their salts, Vegetable Acids in excess, also excess of proteids, sugar and starch in the food, and certain wines and spirits. The Mineral Acids have little or no influence on the acidity of the urine, being excreted as neutral sulphates, chlorides, phosphates, etc.

Benzoic Acid and its salts are among the very few agents by which morbid alkalinity of the urine can certainly be neutralized. *Salol* is much quicker in its action on the urine than is Ammonium Benzoate; as ordinarily in a day or so, under its administration, the urine in chronic cystitis loses its alkalinity and foul odor, and becomes clear (Dr. Mansel Sympson). *Potassium Bitartrate*, being an acid salt, will in most cases acidify an alkaline urine.

Urinary Alkalinizers include the alkalies, particularly Potassium and Lithium Salts, but excepting Ammonia which is broken up in the organism. Sodium salts, being partly excreted by the bile and the bronchial mucus, and partly locked up in the system as the neutral chloride, while sodium urate is insoluble, are not so efficient in this regard as are other alkalies. Fruits, milk and fish also act in the same manner by means of the salts which they convey into the economy, and a strictly vegetable diet plays an important part towards the same end.

Urinary Sedatives and Astringents, when administered internally, act in a sedative manner upon the whole extent of the urinary tract through the medium of the urine, which, being charged with them, gs them into contact with the genito-urinary mucous membrane. of them may be applied locally as far as the urethral and vesical mucous surfaces, the portion above the latter being inaccessible to direct local medication.

Instances of the application of these agents are the use of *Potassium* and *Lithium Salts* to diminish the acidity of the secretion,—*Cubebs*, *Copaiba*, and *Sandal-wood Oil* as antiseptics and astringents,—and urethral injections of *Alum*, Acetates of Zinc and Lead, Boracic Acid, Chloral and Zinc Chlorides, etc., for a simple purpose. *Copaiba* is one of the most efficient agents for rendering the urine antiseptic, and should be more employed in cystitis and urethritis than it is. *Oil of Eucalyptus* is nearly as efficient, and *Stigmata Maidis* (Corn Silk), in tincture, is well thought of for its general alterative influence on the urinary tract.

Uterine Depressants lower the activity of the nervo-muscular apparatus which controls the uterine contractions. The most important of these agents are—

Opium.
Bromides.
Cannabis.
Viburnum Prunifolium.
Chloral.
Chloroform.
Tartar Emetic.
Tobacco.
Sulphate of Copper.
Emetics.
Piscidia Erythrina.

Uterine Stimulants—See OXYTOCICS, *ante*, page 58.

Uterine Tonics and Alteratives, are medicines which are considered to have such specific influence over the uterus. Authorities differ very much regarding the action and use of these agents, but those named in the following list are generally believed to have considerable value in uterine therapeutics, viz.—

Uterine Tonics.	*Uterine Alteratives.*
Potassium Bromide.	Iodine.
Potassium Chlorate.	Iodoform.
Pulsatilla.	Iodized Phenol.
Helonias Dioica.	Glycerin.
Cimicifuga.	Hydrastis.
Savine.	Silver Nitrate.
Astringents (locally).	Galvanism.

Those in the first list, except Astringents, are used internally; those in the second column are employed as topical applications to the uterine cavity or cervix.

Vascular Contractors increase the contractile power of the vessels, lessening the circulation therein and raising the blood-pressure; hence they are used to check hemorrhage and cut short inflammations. The principal agents included in this group are—

Cold.
Ergot.
Barium Salts.
Lead Salts.
Silver Salts.
Zinc Salts.
Antipyrin.
Adrenal Extract.
Belladonna.
Digitalis.
Squill.
Strophanthus.
Opium (small doses).
Cocaine (locally).
Sulphuric Acid.
Hamamelis.
Iron.
Strychnine.

These agents act upon the local vaso-motor mechanism in the walls of the vessels, *amamelis* affecting the venous system especially. *Cold* is one of the most powerful ents of this class, and is also a cardiac sedative. *Adrenal Extract* produces an enor- ous rise of the blood-pressure, due to its extraordinary contractile power over the scular fibres in the walls of the arterioles.

Vascular Dilators produce dilatation of the peripheral vessels, and increase the rapidity of the circulation, thus equalizing the blood-pressure and relieving internal congestions. The most useful are *Alcohol* and *Ether*, as they stimulate the action of the heart simultaneously with the vascular relaxation. The chief members of this group are :—

Alcohol.
Ether.
Nitrous Ether.
Nitroglycerin.
Amyl Nitrite.
Thyroid Extract.
Belladonna,
Stramonium.
Hyoscyamus.
Opium (at first).
Dover's Powder.
Ipecacuanha.
Chloral.
Chloroform.
Ammonium Acetate.
Tartar Emetic.
Camphor.
Heat, by poultices, etc.

The dilating action of *Amyl Nitrite* and other Nitrites is due either to weakening of the muscular walls of the arterioles or to paralysis of the vaso-motor ganglia in them. *Alcohol*, *Ether* and *Opium* probably depress the vaso-motor centre. *Aconite* does not affect the vaso-motor centre or the vaso-motor nerves, hence the lessened arterial tension induced by it is due to its depressant action on the heart alone (Ringer).

The *Vascular Dilators* are often called *Vascular Stimulants* or stimulants of the circulation; but there is this difficulty of speaking of stimulants or sedatives of the circulation, that if both the heart and the vessels are stimulated at the same time, the action of the one tends to counteract that of the other. On the other hand, a drug which weakens the heart may increase the circulation by dilating the vessels, thus acting as a vascular stimulant (Brunton).

Vesical Sedatives are substances which lessen irritability of the bladder, relieving pain and decreasing the desire to micturate. *Opium*, Belladonna, Hyoscyamus, Stigmata Maidis, Cannabis, etc., lessen the irritability of the nerves, *Calcium Carbonate* relieves that due to the presence of calculi; mucilaginous drinks, such as Barley-water or Linseed tea, also astringents like Buchu, Uva Ursi, Pareira, etc., diminish the irritation due to chronic cystitis, and antiseptics, as *Copaiba*, and Cubebs, act in like manner, being carried by the urine to the bladder.

Vesical Tonics increase the contractile power of the muscular fibres in the wall of the bladder. By strengthening the detrusor they prevent retention of urine and by stimulating the sphincter they prevent incontinence. The most important members of this group are Cantharides, Belladonna, Strychnine and Potassium Bromide by internal administration, Silver Nitrate locally, and the use of a urethral bougie.

Cantharides stimulates the sphincter vesicæ by rendering the urine irritant thereto; *Strychnine*, by increasing the irritability of the nerve-centre which governs it. *Potassium Bromide* lessens reflex susceptibility from the bladder, so that the detrusor is less frequently called into action. *Belladonna* probably decreases the sensibility of the bladder to changes of pressure within it. *Silver Nitrate*, locally applied to the neck, acts in the same manner as the passing of a urethral bougie, namely—by altering the direction of reflex action (Brunton).

Visions are caused by several drugs, the action of which is probably exerted on the sight-centres in the cerebrum (angular gyrus and occipital lobes), rather than on the eye itself. The delirium and hallucinations produced by *Alcohol* are familiar examples,—the objects raised thereby being usually animals, as snakes, toads, dogs, etc. *Sodium Salicylate* in some persons produces very disagreeable visions. The *Bromides*, if taken in continued large doses may, during the typhoid condition which follows, cause visions of such intense character that they are often impressed permanently on a brain which, at the time, was utterly unconscious of all its real surroundings. *Digitalis* may produce subjective sensations of the continued presence of light, and *Cannabis Indica*, among the many curious effects produced by its ingestion in large doses, frequently gives origin to similar disturbances of the visual function, of an indefinite and varied but usually pleasant character.

ADMINISTRATION OF MEDICINES.

Medicines may be introduced into the circulation by various routes, including the mouth, the stomach, the rectum, the respiratory tract, the veins and arteries, the subcutaneous cellular tissue, and the integument.

The Mouth is the usual receptacle for medicines intended for the stomach, but may itself be employed for the introduction of minute quantities of powerful agents. A drop of the tincture of Aconite placed on the tongue is quickly absorbed, and soon manifests that fact by its symptoms. Many of the small tablets used for hypodermic administration, if placed under the tongue, are readily conveyed into the system, and used in this way form a very convenient means of medication with alkaloids and other active principles.

The Stomach is the most convenient organ for the absorption of medicines and the one most frequently employed. After being swallowed, the remedies find their way into the current of the circulation through the walls of the gastro-intestinal blood-vessels and the lacteals. When the stomach is empty and its mucous membrane healthy crystalloidal substances in solution pass through the walls of its vessels with great rapidity. *Colloidal Substances* (fats, albumin, gum, gelatin, etc.) require to be digested and emulsified before they can be absorbed. *Iodine* and *Iodides* should be given on an empty stomach, so that they may diffuse rapidly into the blood; if administered during digestion, the acid gastric juice and the starch of the food will alter their chemical constitution and weaken their action. *Acids* should be given, as a rule, on an empty stomach, especially when they are intended to check the secretion of the acids of the gastric juice. *Alkalies*, of which Sodium Bicarbonate may be taken as the type, are given after meals to neutralize excessive acidity, and before meals to stimulate the acid gastric secretions. *Silver Oxide* and *Silver Nitrate* should be administered after the digestive process is ended; if given during digestion, chemical reactions destroy or impair their special attributes and defeat the object for which they were prescribed. *Metallic Salts* (especially corrosive sublimate), also *Tannin* and pure *Alcohol*, impair the digestive power of the active principle of the gastric juice, and should be given by the stomach only during its period of inactivity. *Malt Extracts*, *Cod-liver Oil*, *Phosphates*, etc., should be administered with or directly after food, so that they may enter the blood with the products of digestion. *Bismuth* should be given before meals, as it is usually employed for its local sedative action on the gastric mucous membrane. *Potassium Permanganate* should be given after meals; on an empty stomach it would irritate the mucous membrane and might possibly produce ulceration thereof. *Arsenic* and other irritant and dangerous drugs (such as copper, zinc and iron salts), should be given directly after food, except where local conditions require their administration in very small doses on an empty stomach. *Morphine* should only be given by hypodermic injection when the patient is lying down, unless he is previously habituated to its use. *Pilocarpine*, administered to produce sweating, should be given when the patient is in bed in a warm room. *Ammonium Acetate* acts as a diaphoretic when the recipient is warm in bed, but as a diuretic when the patient is in a cold atmosphere. *Sulphonal* should be given two or three hours before its hypnotic action is desired, as it is very slowly absorbed.

Under some circumstances it becomes necessary to introduce medicines directly into the stomach, as in cases of the patient's inability to swallow, through narcotic poisoning or other causes. The stomach-pump or the stomach-tube may then be employed to convey both food and medicine to that organ. In obstruction of the esophagus, as from stricture or malignant disease thereof, it may become necessary to make an opening through the abdominal wall and the wall of the stomach itself. Nasal feeding, by the use of a small catheter with a hard rubber funnel inserted into its end, is a very efficient method of conveying liquids into the stomach. The eye end of the catheter is oiled and passed gently along the floor of the nose and down the pharynx; the fluid being then poured into the funnel. This method is particularly serviceable in cases of acute tonsillitis or other painful affections of the mouth or palate, also after excision of the tongue, when swallowing is to be avoided as much as possible. In many cases, especially insane ones, the patient will so constrict the muscles of the throat as to force the catheter into the mouth; but if it is withdrawn until nearly out of the pharynx, the presence of the fluid as it drops down will excite swallowing, and the patient may be fed as well as if the tube were in the esophagus.

The Rectum will absorb many substances applied in the form of enemata or suppositories. Those most suited to this route are the salts of the alkaloids in solution, especially those of Morphine, Atropine and Strychnine, the latter being absorbed more rapidly by the rectum than by the stomach. Acid solutions, if not too frequently repeated, are also well administered by this channel. Nutritive enemata must be small, not exceeding three or four fluid ounces, or they will not be retained. They become necessary in many cases, especially in cases of gastric ulcer, in order to afford rest to the stomach. It is often found advantageous to have the food predigested before being administered by the rectum, for which purpose Pancreatin is used. [Compare the articles entitled INJECTIONES and SUPPOSITORIA in Part II and ENEMATA in Part III.]

The Respiratory Tract admits of the rapid absorption of medicinal substances through its extensive blood-supply. The inhalation of vapors or atomized fluids, the insufflation of powders into the nares, fauces, larynx, etc., and the use of a medicated nasal douche, are methods whereby this channel may be utilized. [Compare the article entitled INHALATIONES, in Part II.]

The Veins are only used as a route of medication in emergencies, when the other channels are not available, and where immediate action is necessary to the preservation of life, the operation being a highly dangerous one. The injection intravenously of *Saline Solutions* in the collapse of cholera, diabetic coma, etc., *Blood* or *Milk* as a last resort in excessive hemorrhage, epilepsy, uremia, the collapse of cholera, etc., and a solution of *Ammonia* for the bites of venomous reptiles, Hydrocyanic-acid poisoning, opium-narcosis, chloroform-asphyxia, etc., are the instances admitted in practice.

Arterial Transfusion has also been performed successfully in a number of cases, and is considered safer than venous transfusion when a large quantity of fluid has to be introduced into the circulation. A special apparatus is employed for these purposes, known as Aveling's transfusion syringe, but the ordinary Dieulafoy's aspirator slightly modified may be used with safety and convenience. The danger of the operation lies in the liability of the introduction of air into the circulation, an occurrence which may cause instant death in the human subject.

The Hypodermic Method is the introduction of medicines into the organism by injecting them into the subcutaneous areolar tissue, from which they are quickly absorbed by the lymphatic and capillary vessels. The great advantage of this method is the absolute certainty as to the quantity of drug actively affecting the organism, a very essential question when using small quantities, as when powerful alkaloids are employed. Another advantage is the avoidance of reaction between the drug and the contents of the stomach, which may destroy the activity of the former, or seriously change its character. The medicine must be in solution, and the latter should be of neutral reaction and *freshly prepared;* the usual menstruum being distilled water, though filtered spring water will answer just as well, and much better than distilled water which has been standing several days and frequently exposed to the air. The solution is to be injected *beneath* the skin, not into it, by a hypodermic syringe, care being taken to avoid puncturing a vein. The most suitable localities for the injection are the *external* aspect of the arms and thighs, the abdomen, the back, and the calves of the legs. On the external aspect of the thigh, just in front of the great trochanter, there is an area of some two inches square, over which the insertion of a fine hypodermic needle is not felt, so barren is the skin of sensitive nerve filaments in that region. A few years ago the sight of a hypodermic syringe in a physician's hand suggested an injection of morphine to the patient and to the patient's friends, and many a physician has acquired the reputation of giving morphine on every possible occasion because he administered drugs by the hypodermic method. It is therefore well to inform the patient that another drug is being so administered when such is the fact. In this age of toxin and antitoxin treatment the hypodermic syringe has become a necessity, as many of these agents are inert when given by the stomach. Whenever such preparations are employed their injection must be administered under strict aseptic conditions, applied to the syringe and needle as well as to the site of the operation, and the contents of the syringe should be discharged very slowly into the tissues ***beneath the skin***, giving time for the fluid to diffuse itself without rupturing the connective tissue.

The classic practice of pinching up a fold of the integument before inserting the hypodermic needle is entirely wrong both in theory and in practice. It is never done by persons who habitually use this instrument on themselves, and they are admittedly the most expert of all operators in this line. It increases the liability to local soreness, and often produces bruises and ecchymoses which might be avoided by following the method described below.

After nearly filling the syringe with the solution to be used, the needle, if separate, should be screwed on tightly; and with the instrument held in a vertical position, point uppermost, the excess of solution over the amount required should be ejected, thus expelling air-bubbles and filling the needle itself. A site having been selected, where there is no danger of penetrating a vein or artery, the needle should be quickly inserted at a right angle with the surface, and carried on for fully one-half its length into the subcutaneous tissue, except when a solution of Cocaine is to be injected for the production of local cutaneous anesthesia, in which case it is injected into the skin itself. The syringe should be held steadily, not moved around, so as to avoid injuring the tissue. The piston should be pressed down slowly, and when the injection has been delivered the needle should be quickly withdrawn, and no attention paid to the few drops of solution which may follow it. The very finest needles should alone be used, except in cases where the patient is struggling and liable to break the needle off by his movements. The point of the needle should be perfect and its surface highly polished. It is far better to use a new needle every day than to risk one's reputation for skill on a blunt-pointed and rough-surfaced instrument. The writer buys Green's short and finest needles by the dozen and uses a new one on every patient. He has injected a strychnine solution in this manner on some 300 patients during the last three years, three or four times daily in the same upper arm for a month in each case, without having produced any more serious result than a hyperemic zone around some punctures in a very few instances. If the solutions are freshly prepared with clean water, the needles sharp, clean and bright, and the injections delivered *beneath* the skin and not *into it*, there is no danger of producing abscesses or even indurations with the agents ordinarily employed in this manner. After using the syringe force out all liquid, and wipe the needle-point dry between the fingers, before returning it to the case; the sebaceous matter on the fingers will keep it free from rust. Avoid puncturing a vein; if you do so, watch the patient and prepare an injection containing gr. $\frac{1}{96}$

of Atropine Sulphate, to administer if dangerous symptoms arise. Never, except under special circumstances, administer the Salts of Morphine or Atropine hypodermically to children less than 15 years of age.

Acetanilid, in minute proportion, added to aqueous solutions for hypodermic use, is said to preserve them from decomposition more efficiently than any other agent hitherto employed for that purpose, but *Carbolic Acid*, a drop or two to the fluid ounce, is generally effective in this respect.

Compressed Tablets for hypodermic use are prepared by the prominent manufacturers, and are furnished in glass tubes containing from 20 to 25 tablets each. The writer prefers those made by Wyeth, of Philadelphia, for many reasons. They are very small, are entirely free from any foreign material, are sufficiently soluble, and are put up in short tubes which can be carried in cases to fit the vest pocket. The tablets may be readily dissolved in a teaspoon at the bedside, or in the syringe itself if the instrument has a screw-hole large enough to admit the tablet before screwing on the needle. A regular line of Hypodermic Tablets includes the agents named in the following list, though many others are prepared by the manufacturing chemists.

List of Hypodermic Tablets.

Aconitine (crystals), gr. $\frac{1}{120}$.
Apomorphine Hydrochlorate, gr. $\frac{1}{10}$.
Atropine Sulphate, gr. $\frac{1}{200}$, $\frac{1}{100}$, $\frac{1}{50}$.
Caffeine, gr. $\frac{1}{2}$.
Cocaine Hydrochlorate, gr. $\frac{1}{8}$, $\frac{1}{4}$.
Coniine Hydrobromate, gr. $\frac{1}{6}$.
Colchicine, gr. $\frac{1}{50}$.
Corrosive Sub. and Urea, gr. $\frac{1}{25}$.
Digitalin (soluble), gr. $\frac{1}{100}$.
Duboisine Hydrochlorate, gr. $\frac{1}{100}$.
Ergotin, gr. $\frac{1}{4}$.
Gelsemine Hydrochlorate, gr. $\frac{1}{50}$.
Hyoscine Hydrobromate, gr. $\frac{1}{100}$, $\frac{1}{50}$.
Hyoscyamine, gr. $\frac{1}{100}$, $\frac{1}{50}$.
Morphine Sulphate, gr. $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$.
Morphine & Atropine, No. 1.
  Morphine Sulph., gr. $\frac{1}{8}$.
  Atropine Sulph., gr. $\frac{1}{200}$.
Morphine & Atropine, No. 2.
  Morphine Sulph., gr. $\frac{1}{4}$.
  Atropine Sulph., gr. $\frac{1}{150}$.
Nitroglycerin, gr. $\frac{1}{200}$, $\frac{1}{100}$, $\frac{1}{50}$.
Physostigmine Sulphate, gr. $\frac{1}{100}$.
Picrotoxin, gr. $\frac{1}{50}$.
Pilocarpine Hydrochlorate, gr. $\frac{1}{3}$.
Sodium Arsenate, gr. $\frac{1}{10}$.
Sparteine Sulphate, gr. $\frac{1}{30}$.
Strychnine Nitrate, gr. $\frac{1}{100}$, $\frac{1}{60}$, $\frac{1}{40}$.
Strychnine Sulphate, gr. $\frac{1}{100}$, $\frac{1}{60}$, $\frac{1}{30}$, $\frac{1}{20}$.

[For Formulæ for Hypodermic Solutions, see Appendix.]

Parenchymatous Injection is the delivery of a medicine deeply into the tissues, either to affect a muscle itself or to locally influence some important nerve-trunk. The principal agents used in this manner are Strychnine for palsied muscles, Chloroform for sciatic and other neuralgias, Salts of Cocaine for local anesthesia, and Carbolic Acid for deep-seated inflammations.

The Integument is an active absorbent of crystalloidal substances when its epidermis or cuticle is removed, and many substances may be made to pass through the latter and produce their characteristic effects on the system. By this route there are four methods of introducing medicaments into the circulation—the Endermic, Enepidermic and Epidermic Methods and Inoculation.

The Endermic Method obviates the difficulty of absorption through the cuticle by removing the latter with a blister, and then powdering the medicament over the surface of the denuded derma. Before the introduction of the hypodermic method this procedure was quite common, but it is rarely employed now, as it is both painful and unpopular.

An ordinary Cantharides-plaster, followed by a poultice to raise the blister, may be employed; but a quicker method is to place upon the skin a piece of lint soaked in Stronger Water of Ammonia, covering it with a watch-glass or a piece of oiled silk to prevent evaporation. The blister raises rapidly and should be removed with scissors and the medicine in powder is then placed on the raw surface. Morphine, Atropine, Quinine and Strychnine are the agents generally used in this manner.

The Enepidermic Method consists in placing the medicine in simple contact with the epidermis, no friction being used to hasten its penetration. Chloroform and oleic acid solutions of the alkaloids pass by osmosis in this manner with comparative ease, but aqueous solutions act very slowly, and alcoholic ones with great difficulty if at all. Drugs are readily absorbed from the surface of hot, moist poultices, a fact to be remembered in directing such applications for children, as narcotic poisoning may follow the liberal use of opium in this manner. A good belladonna plaster will cause dilatation of the pupils and may produce the characteristic rash all over the body.

The Epidermic Method or *Inunction* consists in the use of friction to promote the passage of the medicament between the cells of the epidermis. Mercurial ointment, cod-liver oil, and other fats, oleates, etc., are rubbed into the skin of the armpits, the popliteal space, and other parts of the body, for their local and systemic effects. Oil inunctions are an excellent method of introducing fatty substances into children and persons who cannot take oils by the stomach. The inunction of castor oil will produce a purgative effect.

Inoculation is the introduction of medicinal agents through the scraped or punctured skin by an operation which is similar to that employed for vaccination.

DOSAGE OF MEDICINES.

The Doses given throughout this book are for adults; for children the following rule (Young's) will be found the most convenient. Add 12 to the age and divide by the age, to get the denominator of a fraction, the numerator of which is 1. Thus, for a child two years old, $\frac{2+12}{2} = 7$, and the dose is one-seventh of that for an adult. Of powerful narcotics scarcely more than one-half of this proportion should be used. Of mild cathartics, two or even three times the proportion may be employed.

Children bear Opiates badly:—but on the other hand they stand comparatively large doses of several other drugs; such being Arsenic, Belladonna, Ipecacuanha, Calomel and other preparations of Mercury, also Squill, Rhubarb and several other purgatives. arpine has very little effect on children, though it readily induces perspiration and ion in adults.

Hypodermic Injection, the dose should be two-thirds or three-fourths of that e mouth; **by rectum** five-fourths of the same. Strychnine acts more actively n per rectum than by the stomach.

Conditions which modify the action of medicines, and therefore affect their dosage, are—age, body-weight, temperament and idiosyncrasy, drug-habits, intervals between doses, time of administration, condition of the stomach, temperature of the body, cumulative drug-action, mode and form of drug-administration, disease, climate, race, etc.

The Dosage of Medicines is the weakest part of the therapeutic armament, the flaw in our weapons which may be the cause of their failure at any moment, perhaps the most critical one for a life. If the accumulated rubbish of ages, which has been called therapeutic knowledge, is ever to be given scientific shape, or placed in process of becoming a science, the question of dosage must form one of the principal corner-stones in the foundation. Drugs have widely differing actions on the human organism in health and in disease, according as they are administered in different doses, in different menstrua, and during different conditions of the subject's health. This difference, when between extremes of dosage, is often so wide as to separate actions directly contrary to each other, the action of the very large dose opposing that of the very small one:—a truth hidden by one set of dogmatists under their former doctrine (now rule) of "similars," and avoided by the great mass of the medical profession, through dread of the bogy-name "irregular."

In the British Pharmacopœia a minimum and maximum dose is stated for all the more important medicines, the quantities being intended to represent average doses in ordinary cases for adults. In the preface to that work it is however distinctly stated that these doses "are not authoritatively enjoined," and that "the practitioner must rely on his own judgment and act on his own responsibility in graduating the doses of any therapeutic agents which he may wish to administer to his patients." As a matter of fact, most British practitioners ignore the doses given in their pharmacopœia, or at best consider them as mere indications. The German Pharmacopœia has appended to it a table giving the maximum single dose and the maximum daily dose for a number of drugs and preparations, but they are of little value in practice except to catch an unwary physician in a legal proceeding for mal-practice.

In the following pages an effort has been made, whenever possible, to indicate the different doses of active agents for different purposes, and the proper intervals for repetition in certain cases, as determined by the accumulated experience of clinicians, which is the only safe guide in this respect at present. The average doses of the official preparations should be memorized by the student, and the following rules will be found useful for that purpose.

Average Adult Doses of Official Preparations.

Acids (dilute), ♏x;—except Dilute Hydrocyanic Acid, the average dose of which is ♏iij.

Alkalies,—Liquor Potassæ, ♏x, well diluted; Carbonates, gr. xv; Sodium Borate (Borax), gr. xx; Bicarbonates, gr. xxx.

Alkaloids and their Salts, form three groups, (1) those of the *Solanaceæ*, etc., the average dose of which is gr. $\frac{1}{100}$; (2) those from *Nux Vomica*, gr. $\frac{1}{30}$; (3) those from

Opium, gr. ¼ ;—except Codeine, gr. j, Narcotine (which is not a narcotic), gr. iij, Quinine and the other Cinchona alkaloids, gr. x.

Aquæ (Waters), ℥j ;—except Aqua Ammoniæ, ♏x, Aqua Chlori, ♏xv, and Aqua Creosoti, ʒij.

Extracts, gr. v ;—except Ext. Physostigmatis, gr. $\frac{1}{16}$, Ext. Aconiti, gr. ¼, Ext. Belladonnæ, gr. ⅙, Ext. Colchici Radicis, gr. j, Ext. Colocynthidis, gr. j, Ext. Cannabis Indicæ, gr. ½, Ext. Opii, gr. ½, Ext. Stramonii, gr. ¼, and Ext. Aloes, gr. iij.

Fluid Extracts, ♏x ;—except the fluid extracts of Aconite, ♏j, Belladonna, ♏ij, Colchicum-root, ♏v, Colchicum-seed, ♏ij, Digitalis, ♏j, Nux Vomica, ♏ij, Sanguinaria, ♏ij, Squill, ♏ij, Stramonium, ♏ij, and Veratrum Viride, ♏ij.

Infusions and Decoctions, ℥j ;—except Infusion of Digitalis, ʒij.

Mixtures, ℥j ;—except the Mistura Glycyrrhizæ Composita (for children), ʒj, and Mistura Ferri Composita, ʒiij.

Oils, Fixed, ℥ss ;—except Oleum Phosphoratum, ♏iij, and Oleum Tiglii (Croton Oil), ♏j.

Oils, Volatile, ♏ij ;—except Oleum Amygdalæ Amaræ, ♏ss, and the Oils of Copaiba, Erigeron, Cubeb, Eucalyptus, Juniper, Sandal-wood and Amber, of each ♏x.

Pills, gr. v ;—except those of Phosphorus, Ferrum Iodide, Opium, Blue Mass, and Compound Antimony, which are given in smaller doses.

Powders, form two classes: (1) those given in *grains*, including Pulvis Antimonialis, gr. v ; Pulvis Morphinæ Comp., gr. x ; Pulvis Ipecac. et Opii, gr. x ; Pulvis Opii, gr. j ; Pulvis Cretæ Comp., gr. xx ; and Pulvis Jalapæ Comp., gr. xxx ; (2) those given in doses of *a drachm* or more, including Pulvis Glycyrrhizæ Comp., Pulvis Rhei Comp., and Pulvis Effervescens Comp.

Resins, gr. v ;—except Resin of Podophyllum, the average dose of which is gr. ss, and Resin of Copaiba, gr. ij.

Spirits, ʒss or more, according to the amount of alcohol desired to be taken ;—except Spirit of Camphor, ♏x, and Spirit of Nitroglycerin (Spt. Glonoini), ♏iij.

Syrups, ʒj ;—except Syrup of the Iodide of Iron, ♏x, and Compound Syrup of Squill, ♏x.

Tinctures, ʒss ;—except the tinctures of Aconite, ♏j, Belladonna, ♏x, Cantharides, ♏v, Capsicum, ♏v, Colchicum-seed, ♏xx, Digitalis, ♏x, Chloride of Iron, ♏x, Gelsemium, ♏x, Iodine, ♏v, Ipecac and Opium, ♏x, Lobelia, ♏x, Nux Vomica, ♏x, Opium, ♏xv, Physostigma, ♏x, Stramonium, ♏x, Strophanthus, ♏v ; also the tinctures given in larger doses, namely that of Hyoscyamus, ʒij, and Camphorated Opium, ʒij. It is well to remember that children bear the above dose of tincture of Belladonna without difficulty, and that tincture of Aconite should always be given in doses of a drop or less.

Wines, ʒj ;—except those of Antimony, Colchicum, and Opium, the average dose of each of which is ♏x.

Vinegars, are only two in number,—that of Opium, ♏x, and that of Squill, ♏xxx.

PART I.

MATERIA MEDICA AND THERAPEUTICS.

ABRUS, Jequirity (Unofficial),—is the seed of *Abrus precatorius*, the Wild Liquorice, a plant of the nat. ord. Leguminosæ, indigenous in India, but growing wild in most tropical countries. The seeds are small, hard, of a bright scarlet color, and contain some fixed oil, *Abric Acid*, $C_{12}H_{24}N_3O$, and two proteid poisons, a paraglobulin and an albumose, the latter of which is named *Abrin*. The root, leaves and branches contain sugar and a principle which closely resembles glycyrrhizin.

Preparation.

Infusum Abri, *Infusion of Jequirity* (Unofficial),—prepared by macerating three powdered seeds in ℥ss of cold water for twelve hours, adding ℥ss of boiling water, and filtering when cold. It should be used while fresh, as after two or three days it is worthless, and is found in a short time swarming with bacteria. Another formula contains gr. ix to the ℥, with gr. iv of Boric Acid to prevent decomposition.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Jequirity seeds, when moistened with water, become highly poisonous. If applied to the conjunctiva, a severe inflammation is set up, with edema and false membrane, ulceration of the cornea, and extension to the lids, face, neck, and submaxillary glands. Inserted into a wound in cattle, they cause death in a few hours. Sidney Martin has shown that the proteid poisons contained in Jequirity seeds are almost identical in their physiological and toxic properties with the similar principles found in snake venom, although less powerful.

Jequirity is used for the purpose of producing a purulent or croupous conjunctivitis, by which to destroy old granulations (trachoma) and pannus. A mild infusion is applied to the eye two or three times a day for two days, and followed by weak solutions of Alum or Borax. This should be repeated after three weeks if necessary. An emulsion of the seeds in water is a useful application to unhealthy ulcers and lupus.

ABSINTHIUM, **Wormwood**,—the leaves and tops of *Artemisia Absinthium*, a perennial garden herb of the nat. ord. Compositæ, indigenous in Europe, but cultivated in the United States. It contains a volatile oil and a bitter principle, *Absinthin*. Dose, gr. xx–xl, in infusion. There are no official preparations, but of the formerly official Vinum Aromaticum, Absinthium constituted one per cent.

Absinthe, the French liqueur, is an alcoholic solution of the oil, containing also extracts of Anise, Marjoram and Angelica. Its continued use produces various nervous symptoms, morning nausea and vomiting, also a tendency to epileptiform convulsions.

The bitter constituent of Absinthium is stimulant to the digestive organs, but the oil is a narcotic poison. It increases the cardiac action, and produces tremor, stupor, epileptiform convulsions, involuntary evacuations, and stertorous breathing. It is but little used in medicine, only as a stomachic tonic in dyspepsia.

ACACIA, **Gum Arabic**,—is a gummy exudation from *Acacia Senegal*, a small tree of the nat. ord. Leguminosæ, indigenous in Africa. It occurs in spheroidal tears of various sizes, breaking with a glassy, somewhat iridescent fracture; insoluble in alcohol, but soluble in water, forming a thick and mucilaginous liquid. It consists of *Arabin* or *Arabic Acid*, $C_{12}H_{22}O_{11}$, combined with calcium, potassium and magnesium.

Mucilago Acaciæ, *Mucilage of Acacia*,—has of Acacia 35, Water to 100 parts. It should not be prescribed with tinctures or spirits except in very small quantity. Dose, indefinite.

Syrupus Acaciæ, *Syrup of Acacia*,—has of the Mucilage 25, Syrup 75. Should be freshly made. Dose, indefinite.

Acacia enters into the composition of Mistura Amygdalæ, Mistura Glycyrrhizæ Composita, Pulvis Cretæ Compositus, Trochisci Cretæ, Trochisci Cubebæ, and Trochisci Glycyrrhizæ et Opii.

Gum Arabic has no activity except the negative one of a demulcent, and is chiefly used in coughs, sore throats, catarrhal inflammation of the stomach and intestines, and irritant poisoning. It is much employed in pharmacy to suspend insoluble powders in mixtures, for which purpose the mucilage is generally used.

ACETANILIDUM, **Acetanilid**, *Antifebrin*,—is a derivative of *Anilin*, from which it is obtained by the action thereon of glacial acetic acid, substituting the organic radicle Acetyle for an atom of hydrogen. Chemically, it has the name of *Phenyl-acetamide*, and the formula C_6H_5-NHC_2H_3O.

The name *Antifebrin* is copyrighted by its original promoters for trade purposes, and therefore should be dropped from professional usage.

Acetanilid is a white crystalline powder of neutral reaction, and odorless, but of slightly burning taste. It is freely soluble in alcohol, wine, etc., but very sparingly (1 in 200) in cold water, more readily in hot water. In solution it turns orange-red (Antipyrin, grass-green) upon the addition of a few drops of sodium nitrite solution and a few drops of concentrated sulphuric acid.

The Dose ranges from gr. ij to gr. x, repeated twice, and not exceeding gr. xxx in the 24 hours. As much as ʒj has been swallowed without ill effects supervening. It may be administered in the very convenient form of compressed tablets;—also in powders, or in dilute alcoholic solution. ʒj may be dissolved in ℥ivss of brandy, to which, if we add ʒvj each of simple syrup and water, we get a six-ounce mixture, of which a tablespoonful (℥ss) contains 5 grains of Acetanilid, a fair adult dose. As an antipyretic, gr. iij may be administered every ¼ to ½ hour, until 12 or 15 grains have been given, which will usually be a sufficient quantity, especially if given at the acme of the febrile movement.

Unofficial Derivatives and Allied Compounds.

Acetanilid Compound (Aulde),—is a mixture containing Acetanilid 70, Caffeine 10, and Sodium Bicarbonate 20 per cent., and is put up in the form of compressed tablet triturates, each containing ½ grain of the mixture. It is intended to replace the numerous proprietary preparations sold under fancy names, and having acetanilid and caffeine as the active constituents. Dose, from 10 to 30 tablets.

Agathin, *Salicyl-aldehyde-a-methyl-phenyl-hydrazone*,—is a synthetic compound, which has been used extensively in Europe as an anti-neuralgic and anti-rheumatic remedy. Dose, gr. v–x, two or three times a day, but from ʒss to ʒjss must be given before any effect is produced.

Ammonol, *Ammoniated Phenylacetamide*,—a proprietary antipyretic and analgesic, claimed to possess unusual stimulating and expectorant properties due to the loosely combined Ammonia in its composition. Beringer concludes that it is merely an admixture of Acetanilid 2 parts, Sodium Bicarbonate 1 and Ammonium Carbonate 1, with a minute quantity of the dye Metanil-yellow. A similar mixture is used at the Philadelphia Hospital under the name *Ammoniated Acetanilid*, which consists of Acetanilid, 2½ grains, Sodium Bicarbonate, 1½ grains, Ammonium Carbonate, 1 grain; this for a minimum dose. Dose, of Ammonol or Ammonol Salicylate, gr. v–xx.

Analgen, *Ortho-oxy-ethyl-ana-mono-acetyl-amido-chinolin*,—a Chinolin derivative; was reformed by inserting benzoyl instead of the acetyl radicle, and re-christened QUINALGEN. (See next page.)

Analgesine,—a proprietary preparation, consisting of Acetanilid 60, Ammonium Chloride 20, Citrated Caffeine 10, Sodium Bicarbonate 10. Dose, gr. v–xv.

Antikamnia,—is a proprietary preparation widely advertised as an antipyretic and analgesic. Analyses of several samples have been made by different chemists, all of which agree in finding the chief ingredients to be Acetanilid and Sodium Bicarbonate in varying proportions. By some observers Caffeine was detected, also Tartaric Acid, etc. The preparation is formulated by the latest analysis as a mixture of Acetanilid 70, Sodium Bicarbonate 20, and Caffeine 10 per cent. Dose, gr. v–xv, in powder or tablets.

Antikol,—contains Acetanilid 75, Sodium Bicarbonate 17½, Tartaric Acid 7½ per cent. (Squibb). Dose, gr. v–xv. Another "*Antikol*" is advertised by its manufacturer to consist of Acetanilid, Quinine Bisulphate, Sodium Bicarbonate, and Caffeine Citrate, the latter in the proportion of 10 per cent. **Antilupin** is a similar preparation.

Antinervin, *Salbromalide* (*Salicylbromalide*),—is a mixture of Acetanilid 2, with 1 part each of Salicylic Acid and Ammonium Bromide (Ritsert). Dose, gr. v–xv.

Antipyrinum, *Antipyrin* (*Phenazone*),—is described under its own title.

Caffacemon and **Caffenol**,—are mixtures of Acetanilid and Caffeine, and are given in doses of gr. v–xv.

Exalgin, *Methyl-acetanilid*,—is a crystalline compound allied to Acetanilid, occurring in acicular needles, readily soluble in dilute alcohol, less so in warm water, and with difficulty in cold water. Dose, gr. j–v, in wine, or other dilute alcoholic mixture. Alcohol ʒss, and Water ℥j form a permanent solution with gr. xvj of Exalgin. Its name, derived from εξ, *out of*, ἄλγος, *pain*, denotes its principal therapeutic action.

Exodyne is a mixture of Acetanilid 90, Sodium Salicylate 5, and Sodium Bicarbonate 5. The name (from εξ, *out of*, οδύνη, *pain*) sufficiently states its claims to medicinal virtue. Dose, gr. iij–x.

Febrinol, *Methyl-para-acet-phenetidin*,—so called by its proprietors, is a mixture of Acetanilid and other inert substances, advertised at one-half the price of similar coal-tar preparations.

Malakin, *Salicyl-para-phenetidin*,—is a combination of Phenacetin and Salicylic Acid, and is described under SALICINUM, in this book.

Migranin,—is a double Citrate of Antipyrin and Caffeine, and is described under ANTIPYRINUM, in this book.

Neurodin, *Acetyl-para-oxy-phenyl-urethane*,—an analgesic, antineuralgic and antirheumatic remedy. Its antipyretic action is too sudden for it to be used as a general antipyretic. Its action is uncertain and much inferior to that of phenacetin or antipyrin (Lippi). Dose, gr. v–xxv, but ℥jss has been taken in 24 hours without ill effects.

Phenacetin, Methacetin and **Phenocoll**,—are closely allied to Acetanilid, both chemically and medicinally, and are described under the title PHENACETINUM, *et seq.*

Phenatol,—contains Acetanilid, Sodium Carbonate, Bicarbonate, Chloride and Sulphate, also Caffeine. Dose, gr. v–x.

Phenolid,—is a mixture of Acetanilid 58, and Sodium Salicylate 43, and competes with the above as a panacea. Dose, gr. v–xv.

Pyretine,—contains Acetanilid, Caffeine, Sodium Bicarbonate and Chalk, in varying proportions. Dose, gr. v–x.

Quinalgen, *Ortho-ethoxy-ana-mono-benzoyl-amido-quinolin*,—is a derivative of Quinolin (Chinolin), and is a reformation and renaming of the preparation named ANALGEN (see p. 77). It is described under CHINOLINUM. Dose, gr. vij–xv, up to gr. xlv daily.

Salfene and **Kaputin** are Acetanilid mixtures, the latter being simply powdered Acetanilid colored with some indifferent substance.

Thermodin, *Acetyl-para-ethoxy-phenyl-methane*,—is closely allied to Neurodin (see above), which it resembles in all respects except its smaller dose, gr. v–x.

PHYSIOLOGICAL ACTION.

Acetanilid is strongly analgesic, somewhat hypnotic and antispasmodic, a moderately efficient antipyretic, also a decided antiseptic and local anesthetic. It lessens the reflex action of the spinal cord, and inhibits the sensibility of the sensory nerves. It raises arterial tension somewhat, and slows the heart in a corresponding degree, quiet sleep often following.

Compared with the action of Antipyrin, the effect of Acetanilid on the body-temperature is manifested more slowly (1 hour against ½ hour), but lasts a longer time (6 against 2 hours). It is markedly diuretic, and somewhat diaphoretic; is a cerebral, muscular and vaso-motor stimulant, and leaves no ill after-effects;—while Antipyrin is powerfully diaphoretic, a cerebral sedative, and produces great depression. Furthermore, Acetanilid frequently produces nearly the same degree of reduction of body-temperature as Antipyrin, with the ingestion of only one-fourth the dose; and, like the latter agent, it has little or no effect on the normal temperature, but its continued use begets tolerance of its action. Its antipyretic action, is, however, less reliable than that of Antipyrin, and corresponds in degree and in duration to the size of the dose. There is neither vomiting nor diarrhea afterwards, but there is a tendency in some cases to collapse with chills and cyanosis, especially the latter, during the period of depressed temperature. The cyanosis often caused by this drug without other toxic symptoms is probably due to the liberation of free anilin in the blood.

A toxic dose destroys the ozonizing function of the blood, decolorizing its corpuscles and forming methyl-hemoglobin. The heart, liver and kidneys of animals poisoned thereby are found in a state of acute fatty degeneration. Its continued use in large doses is highly injurious to the blood, especially in diseases (as typhoid fever) which are themselves destructive to the blood-elements.

THERAPEUTICS.

Besides being a fairly efficient antipyretic, Acetanilid has marked analgesic and antispasmodic powers; and these, together with its great advantages of a small dose, comparative efficiency and safety, and the absence of the severe rigors and cardiac depression which mark the chinolin derivatives, combine to make it an agent of wider therapeutical range than most of its analogues. It is especially useful in phthisis and typhoid fever for its action on pyrexia, thereby relieving wakefulness, lessening delirium, and upholding a failing heart; but if long used in large doses in the latter disease it may increase the liability to serious sequelæ, especially periostitis of the ribs, gangrene of tissues, etc. For the pains of locomotor ataxia, and in those of rheumatic origin, as sciatica and lumbago, it is a most efficient remedy. In acute rheumatism, influenza, and scarlet fever it is highly praised; and in acute bronchitis doses of four grains every two hours have often arrested the attacks within twenty-four hours. In epilepsy it has been tried, with the view of moderating reflex excitability. Added in minute proportion to aqueous solutions for hypodermic use, it is said to preserve them from decomposition more efficiently than any other agent hitherto employed for that purpose. It acts very well with children, when used in proper doses; but in all cases overdosing must be avoided, both as to quantity and repetition.

Acetanilid is now extensively employed in surgical practice as a dry dressing for wounds, burns, scalds, and other injuries involving breach of the tissues. Dusted in fine powder over the surface of a wound it promotes healing, prevents suppuration, relieves pain, and is odorless, unirritant and non-toxic, though a few cases of very young children are reported in which its topical application to wounds caused cyanosis and symptoms of collapse. It has also been used with much benefit as an application to mucous patches and rectal ulcers.

Antinervin attracted much attention during the epidemic of influenza in Scotland, as an analgesic and antipyretic. It relieved the pains in the back and head, reduced the fever and produced copious perspiration, without being followed by unfavorable sequelæ. It has proven to be of great benefit in acute rheumatism, and may be used with advantage in all abnormal excitement of the nervous system, either against neuralgia or as a general nerve sedative. The best way to prescribe it is as an extemporaneous mixture, containing the proper proportions of its ingredients, viz.—Acetanilid 50, Salicylic Acid 25, and Ammonium Bromide 25 per cent., mixed *secundum artem*, and administered in doses of gr. v–xv every two hours until relief is obtained.

Exalgin resembles Acetanilid and Antipyrin in its antipyretic and analgesic powers. Compared with the latter it is less efficiently antipyretic, but more powerful as an analgesic and antiseptic. In overdose it is highly dangerous, having produced symptoms resembling those of angina pectoris, also toxic effects resembling those of carbolic acid, with delirium, dyspnea, cyanosis, and renal disturbances. It has been used with most excellent results in neuralgias; also in chorea. In the latter affection daily doses of 3 grains were sufficient.

ACIDUM ACETICUM, Acetic Acid,—is a liquid composed of 36 per cent. of absolute *Acetic Acid*, $HC_2H_3O_2$, and 64 per cent. of water. It is a clear, colorless liquid, of a distinctly vinegar odor, a purely acid taste, and a strong acid reaction; miscible in all proportions with water and alcohol, and wholly volatilized by heat. It is prepared from wood by destructive distillation and purification. Acetic Acid is also official in two other degrees of concentration, viz.—

Acidum Aceticum Glaciale, *Glacial Acetic Acid*, $HC_2H_3O_2$,—is nearly or quite absolute Acetic Acid, solid below 59° F., above that temperature a colorless liquid. Is strongly escharotic and only used locally.

Acidum Aceticum Dilutum, *Diluted Acetic Acid*,—consists of Acetic Acid 10, Distilled Water 50 parts, contains 6 per cent. of absolute Acetic Acid, and has a sp. gr. of 1.008. Dose, ʒj–ij.

Acetum, *Vinegar* (Unofficial),—is an impure diluted Acetic Acid, produced by the acetous fermentation of any liquid susceptible of the vinous fermentation.

Diluted Acetic Acid is used in the preparation of the two official Aceta (Vinegars).

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Acetic Acid, like the other vegetable acids, in concentrated form is escharotic and produces gastro-enteritis if swallowed. In dilute form it acts as a refrigerant, diminishing thirst and allaying restlessness. It forms salts in the stomach, thus enters the blood, and is there oxidized, producing carbonic acid and thereby increasing the acidity of the urine. It is also diuretic. Long used, it causes emaciation and poverty of the blood, producing a general scorbutic condition. It is a hemostatic and anthelmintic, and the vapor inhaled causes reflex contraction of the vessels and raises the blood-pressure. Lately, investigations into its germicidal powers have given it high rank among germ-destroyers, a solution containing 7 per cent. of this acid proving as efficient as mercuric chloride.

The glacial acid is used as a caustic in many skin affections, as warts, condylomata, etc., and to destroy the parasite in ringworm and pityriasis. It has been employed locally in carcinoma, with the view of dissolving the supposed cancer-cells. The dilute acid is used locally in superficial inflammations of the skin, and may be sponged over the body to check perspiration and reduce the surface temperature in fevers. It is often administered internally to reduce obesity, which it does by impairing digestion. Locally, it may be employed to arrest slight hemorrhages, as epistaxis; and it is occasionally used by enema for the destruction of ascarides. Acetic acid is highly praised by Squibb as a solvent for the active principles of drugs, which it extracts completely, so that it may be substituted for alcohol in the preparation of both fluid and solid extracts.

ACIDUM BORICUM, Boric Acid, *Boracic Acid,* H_3BO_3,—is a weak acid occurring in transparent, colorless, six-sided plates, of unctuous touch, odorless, of a cooling and slightly bitter taste, soluble in 25 of water, in 15 of alcohol and in 10 of glycerin. Its aqueous solubility is increased by the addition of hydrochloric acid or borax. It is produced from Borax by the action of sulphuric acid; also by the purification of the native acid. Dose, gr. v–xv. There are two official Borates, viz.—

Sodii Boras, *Sodium Borate (Borax),* $Na_2B_4O_7 + 10H_2O$,—colorless, transparent prisms, of cooling and sweetish, afterwards alkaline taste, and alkaline reaction, soluble in 16 of water at 59° F., and in 0.5 of boiling water; insoluble in alcohols. Occurs native in ancient lake beds in the Death Valley region, California, and various other parts of the world. Dose, gr. v–xxx.

Glyceryl Borate, *Boroglycerin,*—official in the following preparation,—

Glyceritum Boroglycerini, *Glycerite of Boroglycerin (Glycerite of Glyceryl Borate, Solution of Boroglyceride),*—prepared by heating together Boric Acid 301 and Glycerin 460, until reduced to 500 grammes, then adding an equal weight of Glycerin.

Unofficial Preparations.

Boracic Ointment,—has of Boracic Acid 1, White Wax 1, Paraffin 2, Almond Oil 2, thoroughly mixed together.

Boracic Lotion,—is a saturated solution of the acid in water.

Boracic Lint,—prepared by steeping lint in a boiling saturated solution and drying. It contains nearly one-half its weight of the acid.

Borine,—is a proprietary antiseptic preparation, advertised to be "composed of the active constituents of Benzoin, Wintergreen, Meadowsweet, Golden Rod, Witch Hazel, combined with the stearoptenes of Wild Thyme, Eucalyptus, Peppermint, and Boracic Acid." What the stearopten of Boracic Acid is the advertisers do not say. It is intended chiefly for external use, diluted, 1 part to 1–4 of water; but may be used internally in doses of ʒj–ij.

Boroglyceridum, *Boroglyceride,*—is a solid chemical compound, prepared by heating together Boric Acid and Glycerin. It is soluble in water, but is generally used in solution with glycerin, as the above official glycerite. It combines readily with Chrysarobin, Carbolic Acid, Atropine and Morphine, and is used as a local application in eye diseases and skin affections.

Borolyptol,—is a proprietary preparation intended for use as an antiseptic, both internally and locally. It is said to be composed of Aceto-boro-glyceride 5 per cent., Formaldehyde 2 per cent., together with the active antiseptic constituents of Pinus pumilio, Eucalyptus, Myrrh, Storax and Benzoin. Dose, ʒj–ij, as an intestinal antiseptic.

Euthymol and **Euphormol** are similar preparations, advertised as containing Boric Acid, Thymol, Menthol, Oil of Eucalyptus, etc.

Listerine,—is a proprietary preparation, advertised to be "the essential antiseptic constituent of Thyme, Eucalyptus, Baptisia, Gaultheria and Mentha Arvensis, in combination. Each fluid-drachm also contains two grains of refined and purified Benzo-boracic Acid,"—whatever that may be. It is chiefly intended for external use, but may be given internally, in doses of ʒj three or more times a day (as indicated), either full strength, or diluted with water, or in combination with other drugs.

Magnesii Bora-citras, *Magnesium Borocitrate,*—prepared extemporaneously thus: ℞. Magnesii Carbonatis ʒj, Acidi Citrici ʒij, Sodii Biborat. ʒij, Aquæ Bullientis ℥viij. A tablespoonful three or four times daily as a solvent of uric acid calculi.

Potassii Tartra-boras, *Potassium Tartraborate,*—is a better solvent of uric acid calculi than the Magnesium salt, and is soluble in 2 parts of cold water. Prepared by heating together Boracic Acid 1, Potassii Bitartras 4, Water 10 parts. Dose, gr. xx, largely diluted with water, three or four times a day.

Sodium Tetraborate is a new preparation (or salt?) obtained by heating together equal parts of Boric Acid, Borax and Water. The resulting compound is neutral, and is supposed to be an entirely new salt. It was introduced to furnish a more soluble form of Boric Acid, and may be used wherever the latter is indicated, but it has the disadvantage of forming hard crusts upon dressings, which irritate abraded surfaces.

It has long been known that the addition of Borax to Boric Acid in aqueous solution greatly increases the solubility of the acid,—and the above may explain the observed fact.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Boric Acid is an efficient antiseptic, disinfectant and deodorant, arresting fermentation and putrefaction, and very destructive to all low organisms. A solution of 1 in 133 arrests the activity of bacteria. It is feebly acid and but slightly irritant, and is used in the form of a dusting powder as a surgical dressing for its antiseptic and unirritating qualities. Its lotion and ointment have been successfully employed in ulcers, eczema, burns and scalds, pruritus ani, fetid perspiration, wounds, tinea tonsurans, and tinea circinata.

Sodium Borate is a powerful antiseptic and disinfectant, as it destroys low vegetable organisms. It removes the epidermis when locally applied, has power to increase uterine contraction, and aids the solution of benzoic and boric acids. It is employed as a wash to remove the epidermis from the skin, and as a sedative lotion in acne, freckles, chloasma, leucorrhea, aphthæ, etc., also to allay itching in urticaria, psoriasis, impetigo, and in pruritus pudendi, scroti et ani. It has been used internally in amenorrhea, dysmenorrhea, puerperal fever, and puerperal convulsions, for its supposed specific action on the uterus; and has been found beneficial in epilepsy, though far inferior to potassium bromide in efficacy and far more dangerous in toxic effects. It is apparently of most service in cases where the bromides fail and in those in which the epilepsy is associated with gross organic disease.

When administered in large doses Borax produces certain toxic symptoms to which the term *Borism* is applied. These include intestinal disturbance, nausea, vomiting and anorexia, also dryness of the skin, with redness and even inflammation of the mucous membranes. There is great general weakness, the hair is dry and falls out, and there is an eruption on the skin, which may assume the forms of seborrheic eczema, reddish patches which desquamate like psoriasis, or papules attended with much itching. In severe cases albumin may appear in the urine, and edema of the face and extremities may occur, so that whenever this drug is given in full doses, a careful watch should be kept upon the state of the urine (Féré).

Boro-glyceride in aqueous solution (1 to 40), or as an official Glycerite, is also a powerful antiseptic, and is used as a lotion in purulent ophthalmia and in the treatment of wounds, also as a local application to diphtheritic membranes. It is an efficient preservative of milk and food against putrefactive changes, and is entirely harmless.

An elegant cosmetic cream may be made by dissolving Boric Acid in Glycerin, and then incorporating it with White Wax and Almond Oil.

ACIDUM CARBOLICUM, Carbolic Acid, Phenol, *Phenic Acid, Phenyl Alcohol,* C_6H_5OH,—occurs in Castoreum, in the urine of man and of herbivorous animals, and in the products of the dry distillation of various organic substances, such as resin, bones, wood and coal. It is obtained by the fractional distillation of coal-tar, and subsequently purified; occurring in colorless, interlaced, needle-shaped crystals, of characteristic, aromatic odor, deliquescent on exposure to damp air, and acquiring a reddish tint with age and light. When copiously diluted with water it has a sweetish taste, and a slightly burning after-taste. It is soluble in about 15 of water, very soluble in alcohol, ether, chloroform, benzol, glycerin, oils and carbon bisulphide; almost insoluble in benzin. It is melted by gentle heating, and is liquefied by the addition of about 8 per cent. of water. Dose, gr. ¼–ij, well diluted.

Acidum Carbolicum Crudum, *Crude Carbolic Acid,*—is obtained as above stated, but by a lower degree of heat; and contains various other constituents of coal-tar besides Phenol, chiefly *Cresol* (Cresylic Acid) and *Xylic Acid,* in varying proportions. Is used as a disinfectant.

Peculiarities about Carbolic Acid are that the addition of about 8 per cent. of water liquefies it, while a further addition of water produces a turbid mixture, until about 15 parts of water to 1 of the acid is reached, when a stable and clear solution is formed. One volume of the liquefied acid, containing 8 per cent. of water, forms with one volume of Glycerin a clear mixture, which is not rendered turbid by the addition of 3 volumes of water (absence of Creosote and Cresol).

Hitherto described as neutral to litmus paper, it is now officially given a faintly acid reaction. Its claims to be considered an acid are, however, very feeble, as, though it combines with salifiable bases, it is incapable of neutralizing the alkalies, and its combinations are decomposed by the feeblest acids (carbonic, etc.), sometimes, it is asserted, even by water. Chemically, it is considered to be the Hydroxyl (HO) derivative of Benzene (C_6H_6), which would ally it to the alcohols; but as it does not yield the same products on oxidation (yielding finally oxalic instead of acetic acid), it is taken as the type of a class called *phenols,* which are simple HO derivatives of the aromatic hydrocarbons. [For the chemical theory of the Benzene derivatives see the sub-title SUBSTITUTES FOR QUININE, under the title CINCHONA.]

Carbolic acid is converted by concentrated sulphuric acid into Sulpho-carbolic Acid, $C_6H_5HSO_4$; by nitric acid into several substitution-products, the most important of which is Picric Acid. The reddish tint which it acquires with age and light, does not impair its properties; but is not accounted for satisfactorily, though supposed to be due to the presence of *Aurin* and *Rosolic Acid*, impurities which form a red compound by the absorption of CO_2 and oxygen.

Carbolic Acid coagulates albumin and collodion, Creosote does not.

Official Preparations.

Unguentum Acidi Carbolici, *Ointment of Carbolic Acid*,—strength 5 per cent. Carbolic Acid 5, Unguentum 95. For external use.

Glyceritum Acidi Carbolici, *Glycerite of Carbolic Acid*,—has of Carbolic Acid 1, in Glycerin 4. Dose, ♏v–x in water. It should be diluted with an equal quantity of water for external use.

Sodii Sulpho-carbolas, *Sodium Sulpho-carbolate*, $NaSO_3C_6H_4(OH) + 2H_2O$,—is prepared by dissolving Carbolic Acid in an equal part of strong Sulphuric Acid, thus forming sulpho-carbolic acid, which is neutralized with barium carbonate, and then treated with water and sodium carbonate, forming a solution of Sodium Sulpho-carbolate, which is evaporated to crystallization. It occurs in transparent, rhombic prisms, soluble in 5 of water, less freely in alcohol and in glycerin. Dose, gr. x–xxx.

Sulpho-carbolates of Ammonium, Magnesium, Potassium and Sodium crystallize in tufts of acicular crystals, more or less white; Sulpho-carbolate of Copper, in transparent, light blue, interlacing prisms; of Iron, in small brown, micaceous crystals; of Zinc, in transparent, rectangular, colorless plates. That of Sodium is the only one official.

Unofficial Preparations.

Aqua Acidi Carbolici, *Carbolic Acid Water*,—has of the Glycerite of Carbolic Acid ʒx, to Aquæ Oj. Dose, ʒj–iv.

Carbolic Acid Solutions,—for antiseptic surgery, are—

- 5 per cent. in Water, (♏xxv to the ℥), as a spray or wash. Is decidedly irritant.
- 2½ per cent. in Water, (♏xij to the ℥), for sponges, hands, or as a lotion.
- 5 per cent. or less in Olive Oil, as a special dressing.

Carbolic Acid Gauze,—is Gauze medicated with Carbolic Acid 1, Resin 5, Paraffin 7, and may be used as a surgical dressing.

Carbolic Acid Plaster,—an unofficial plaster composed of Carbolic Acid 25, Shellac 75, coated with Gutta-percha dissolved in Carbon Disulphide.

Phenol Sodique,—is composed of Carbolic Acid, gr. 188, Caustic Soda, gr. 31, Distilled Water, ℥iv.

Phenol-camphor,—has of Carbolic Acid and Camphor, equal parts. A colorless, refractive liquid; soluble in alcohol, ether, chloroform and oils; insoluble in water or glycerin. Used as a local anesthetic, chiefly for toothache; also in the proportion of Carbolic Acid 1, Camphor 3, as an application to false membrane in diphtheria, and as subcutaneous and intrapulmonary injections in phthisis. *Campho-phenique* is a similar preparation. (See under CAMPHORA.)

Phenol Iodatum, *Iodized Phenol*,—a mixture of Iodine and crystallized Carbolic Acid. (See under IODUM.)

Pheno-resorcin,—is a mixture of Carbolic Acid 67 with Resorcin 33 and Water 10, forming a liquid which mixes readily with water. It is supposed to combine the virtues of both its ingredients.

Phenosalyl,—is a clear, syrupy liquid, consisting of a mixture of Carbolic, Salicylic and Benzoic Acids, melted together and dissolved in Lactic Acid. It is very soluble in water, has a pleasant and non-persistent odor, and is used in a 1 per cent. solution as an antiseptic application.

Aseptol,—is the trade name of a 33.3 per cent. solution of *Sozolic* or *Ortho-phenol-sulphonic Acid*, which is formed when Carbolic Acid is dissolved in concentrated Sulphuric Acid. Aseptol occurs as a syrupy liquid which crystallizes in small deliquescent needles, decomposes when distilled and is very soluble in water, also in alcohol and in glycerin. It has a faint odor of carbolic acid, and is asserted to be antiseptic but neither poisonous nor irritant, and hence of especial value in abdominal and ophthalmological surgery. In spite of these allegations it is probably toxic, and at any rate has been shown, by a careful series of comparative experiments, to have not more than one-third the antiseptic power of carbolic acid. It has been recommended for internal use as a substitute for Salicylic Acid, on account of its greater solubility. It has been employed in concentrated solution for the treatment of pharyngitis and diphtheritic laryngitis. Externally it is used so diluted as to contain from 3 to 10 per cent. of the active principle.

Aseptolin,—is a solution containing about 2¾ per cent. of absolute Carbolic Acid and 0.02 per cent. of a new pilocarpine salt named *Pilocarpine-phenyl-hydroxide*. It is intended for hypodermic use only, in one daily dose of 50 to 250 minims for adults, injected into the abdominal parietes or into the muscles of the back.

Allied Products and Derivatives.

Creosotum, *Creosote*,—is a similar product, obtained from wood-tar. It consists of a mixture of phenols, chiefly Guaiacol ($C_7H_8O_2$), and Creosol ($C_8H_{10}O_2$); and by the action of nitric acid is converted into oxalic acid principally, while Carbolic Acid is converted into picric acid by that reagent. Creosote does not coagulate albumin or collodion, Carbolic Acid does. It is described under its own title.

Resorcinum, *Resorcin*, $C_6H_6O_2$,—is also a phenol, obtained from certain resins by the action of fusing alkalies, and is described under its own title.

Creolin (Unofficial),—was the first form in which the cresols were presented in a liquid condition for use in medicine. It is a coal-tar product, occurring as a dark brown, alkaline, semi-fluid substance, of the consistence of honey. It forms a white cloud when added to water, with which, however, it is miscible, as an emulsion, up to about 10 or 12 per cent. strength. The Solutions in general use vary from ½ to 2 per cent.; the Ointments to 5 per cent., and Creolin Gauze is prepared of 10 per cent. strength of the drug. Dose, ♏iij–v, in capsules.

Lysol (Unofficial),—one of the latest disinfectants and antiseptics, is a saponified product of coal-tar. It is essentially a solution of tar-oils (cresols) in neutral soap, and occurs as a clear, brown, oily liquid, miscible readily with water, and forming clear solutions with glycerin, alcohol, chloroform and various other fluids. It is employed as a local application only, generally in a 1 per cent. solution.

Trikresol (Unofficial),—is a mixture of the three isomeric cresols, respectively named the ortho-, meta- and para-methyl phenols, and also contains the hydroxyl group, which seems to be a characteristic constituent of antiseptics and germicides. It occurs as a white liquid, of creosote-like odor, sp. gr. 1,042 to 1,049, and is soluble in water to the extent of 2.55 per cent. Its solutions are clear and do not impart any sensation of numbness to the fingers. It is a powerful germicide in solutions of 1 per cent. strength, which are said to be as efficient as a 5 per cent. solution of carbolic acid. Trikresol Water (1 part to 1000) is used as a menstruum for the ordinary collyria employed in ophthalmological practice.

Saprol, *Disinfection Oil* (Unofficial),—is a dark brown, oily mixture, highly inflammable, and composed of the crude cresols in a great excess of the liquid hydrocarbons obtained from the refining of petroleum. It floats on water and yet gives up its soluble constituents as disinfectants to the offending fluid, leaving the remainder as an oily film on the surface to hinder the escape of disagreeable odors, and the spread of infecting spores. It is a cheap disinfectant, and can be employed on a large scale in barracks, prisons, schools, etc., if no light or fire is brought into proximity with it. Sewage treated with it still retains its value as a manure; and so small a quantity as one per cent. of it will effectually sterilize urine and fecal matter impregnated with micro-organisms, as the bacilli of cholera and typhoid fever (Laser).

Solutol and **Solveol** (Unofficial),—are disinfectants of the same class as the preceding, both being soluble forms of the insoluble Cresol (Cresylic Acid). Solutol is an alkaline solution of Sodium Cresylate in an excess of Cresol, and is not suited for surgical use, by reason of its caustic alkalinity; but is of marked utility in the preservation of the cadaver, and for general and copious use in disinfecting water-closets, sinks, infected bed-clothing, sputa, and deleterious discharges of all kinds.

Solveol differs from Solutol in containing sodium cresotate instead of sodium cresylate, is devoid of the causticity so characteristic of the latter substance, and is also free from the greasiness of creolin and lysol. It is a dark-colored, nearly odorless liquid, of neutral reaction, soluble in water in all proportions. It is especially applicable to surgical uses, a ½ per cent. solution being employed for dressing, being more active (it is claimed) antiseptically, than a 2 per cent. solution of carbolic acid.

PHYSIOLOGICAL ACTION.

Carbolic Acid is antizymotic and antiseptic, a good disinfectant, somewhat antipyretic, also a local anesthetic, and a depressant of the cardiac, respiratory, cerebral and spinal functions. In strong aqueous solutions it is destructive to low forms of life, rapidly destroying all organized ferments, both animal and vegetable. On unorganized ferments (enzymes), such as pepsin and ptyalin, it does not act so readily, but in large doses it likewise destroys their activity, and it is an efficient parasiticide against certain vegetable parasites which infest the skin. The foregoing is true of the liquefied acid and its aqueous and glycerin solutions, but not of its solutions in oils, which have no antizymotic properties.

Applied to the skin in weak or moderately strong solutions, it produces local anesthesia with a sensation of numbness, which lasts for several hours. Applied in concentrated form, it is irritant and superficially escharotic, with burning pain of brief duration, and produces at the point of application a white spot, changing to red if the acid is soon removed. It does not vesicate, but if the application be prolonged, a white eschar or slough results, from coagulation of the albumin of the tissue, and this is bordered by a red zone of inflammation. Even a 3 per cent. aqueous solution, kept on a part for several days, has produced dry gangrene of the tissues (Czerny).

Taken internally, the concentrated acid has the same effect on the mucous membranes as on the skin, producing white, superficial eschars, after burning pain of short duration, in the mouth, gullet and stomach. To the latter viscus it is a powerful irritant, and causes a violent gastritis. In medicinal doses, when acted upon by the gastric secretions, it is converted into a sulpho-carbolate, and is so diluted by the contents of the stomach that it loses its antizymotic power, and hence is of no value as an internal antiseptic remedy. In the blood it probably circulates as an alkaline carbolate, in medicinal doses having no effect upon the circulation or respiration. Its antipyretic power is incapable of being utilized, requiring a dosage which would be dangerous.

A toxic dose paralyzes the vaso-motor centre in the medulla before markedly affecting the heart. The blood-pressure and body-temperature fall; the respiration, at first accelerated by stimulation of the vagi, is quickly depressed and ultimately paralyzed; cardiac inhibition is stimulated, the heart being first slowed and then depressed. The anterior cornua of the spinal cord are first stimulated, producing convulsions; and subsequently depressed, causing suspension of reflexes, impaired motility and sensibility, and finally paralysis of both motion and sensation. The cerebrum is profoundly depressed, producing stupor deepening into coma, with minutely contracted pupils. Death occurs, in most cases, by paralysis of respiration; in a few, by paralysis of the heart.

Carbolic Acid is readily absorbed and rapidly diffused; many fatal cases having resulted from its external use in undiluted form. A single vaginal injection of a moderately weak solution has produced very severe constitutional results. It is partly oxidized in the blood, and partly eliminated by the lungs and kidneys. It imparts to the urine a peculiar smoky or olive-green color, which is not due to blood, and may be seen after moderate doses, or even as a result of its absorption from dressings. When ingested in a large dose, the acid itself may appear in the urine; but the smoky color is due to the presence of its intermediate oxidation products, viz., pyrocatechin (only in alkaline urine), and hydrochinon, also salts of sulpho-carbolic acid and glycuronic acid. In poisoning thereby the sulphates are absent from the urine.

A case of poisoning by Carbolic Acid shows white, corrugated eschars in the mouth and fauces, if the drug has been swallowed in concentrated form. These eschars are also found on the mucous lining of the esophagus and stomach, at the autopsy. The patient has complained of an intense, burning sensation along the same tract, immediately after the ingestion of the poison, and soon passes into a state of collapse; the skin being cold and clammy, the pupils contracted, respiration becomes more and more feeble and shallow; the urine, if not entirely suppressed, is of a dark-green color; reflexes are then abolished, stupor and coma supervene, and finally the breathing ceases. The blood, after death, is dark in color, and coagulates imperfectly; and fatty degeneration of the liver and kidneys may be found. When poisoning occurs by absorption, an early symptom is the peculiar, smoky color of the urine. There may be pain in the lumbar region, indicating renal irritation, and slight restlessness or cerebral disturbance; after which comes the impairment of respiration and stupor.

A toxic dose of Carbolic Acid, taken internally, is one of the most rapidly acting poisons known, sometimes equalling Prussic Acid in this respect. The symptoms develop almost immediately, and death may occur in a very few minutes; but usually the patient lives from one to ten hours; rarely over two days. In some cases, a great amendment has occurred, with restoration of consciousness, but after some hours sudden and fatal collapse has supervened. The minimum fatal dose is not determined, but ℥ss has frequently caused death; and doses as small as ♏vj have given rise to dangerous symptoms. Cases of suicidal and accidental poisoning by this drug are very frequent, by reason of the facility with which it may be obtained for use as a disinfectant.

Professor Mann has shown that during the ten years previous to 1895 there were 917 deaths from Carbolic Acid, a yearly average of nearly 100; while in the year 1894 alone the number of deaths from this cause reached the appalling total of 202.

Treatment of Poisoning by Carbolic Acid.

If the case is seen shortly after ingestion, *Apomorphine* may be administered hypodermically, as a rapidly acting emetic; but, in any case, the stomach should be washed out freely. The chemical antidote is any soluble sulphate to form the harmless sulpho-carbolates; as *Magnesium Sulphate* ℥j, or *Sodium Sulphate* ℥ss, dissolved in ½ pint of water. Even if several hours have elapsed since the ingestion of the poison, the sulphates should be used, as their antidotal action proceeds in the blood current. *Alcohol*, is a perfect antidote to the corrosive effects [see under Poisoning by Carbolic Acid in Part III]. *Stimulants*, as ether or brandy hypodermically, should be used freely; also hot water bottles and hot blankets if signs of collapse appear. Vegetable demulcents may be given (but no oils or glycerin), to protect the mucous surfaces. *Liquor Calcis Saccharatus*, or *Syrupus Calcis*, is also antidotal to the poison in the stomach, but is much less efficient than the sulphates. *Atropine*, hypodermically, is a very complete physiological antagonist to the systemic symptoms, maintaining the heart and respiration until elimination occurs (Post). *Cider Vinegar* may prove antidotal, as it removes the effects of the local application of the strong acid. *Soap*, in strong, watery mixture (suds), is said to have acted as a perfect antidote; but its action would be confined to the poison in the stomach. Oils should not be used, as they increase the absorption of the poison.

THERAPEUTICS.

Carbolic Acid owes much of its prominence to its having been the principal agent at first used in the antiseptic method of treating wounds; but its employment in that connection has become much restricted, and many of the most prominent surgeons have abandoned it altogether in favor of other germicides. Recent investigations have proved beyond doubt that this agent has a reputation as a germicide far above that which it deserves; that in the ordinary solutions it is almost useless as a germicide though actively antiseptic; and that very many hours of exposure to very strong solutions are required to kill pathogenic germs. In the estimation of many, however, it still retains high favor as a surgical antiseptic lotion; and it is in general use as a disinfectant for surgical instruments, hospital apparatus, soiled linen, etc. The carbolic spray, formerly so commonly used during operations, has been entirely discarded. For disinfectant purposes about drains, privies, on floors, walls, etc., the crude acid is to be preferred, not only on account of its less cost, but also for the reason that its principal impurity, Cresol (Cresylic Acid), has very high power as a disinfectant.

As a local application, Carbolic Acid has extensive and varied uses. Unna calls it the opium of the skin, as it relieves pruritus of almost any rm, if applied in 5 per cent. aqueous solution over the itching surface; d a lotion, composed of gr. xx to ℥ss each of water and glycerin, makes a very efficient application for the itching of jaundice. The glycerite, diluted, effectively destroys the fungus of tinea tonsurans or tinea versicolor, and may be applied as a stimulant to indolent ulcers, or to the patches of aphthous stomatitis. A one per cent. solution in water and glycerin (♏v to ℥j) makes an excellent anesthetic and cleansing gargle for the painful sore throat of diphtheria, tonsillitis, etc. Cotton soaked in the strong acid will stop the pain of a decayed tooth, but care must be taken, by covering it with dry cotton, to prevent its access to the gums, or sloughing thereof may result. For burns, one of the best dressings is carbolized sweet oil (ʒj to ℥vj) to relieve the pain. For local anesthesia in minor surgical operations, such as that for ingrowing toe-nail or opening a felon, the part may be soaked for ten minutes in a 30 per cent. solution, or the pure acid may be brushed over the line of incision.

As a parenchymatous injection, which should be not over ʒss of a 2 per cent. solution, Carbolic Acid has been employed with much success in combating deep-seated inflammations. The skin being first anesthetized by the local application of the acid, a hypodermic needle is introduced obliquely, to the centre of the inflamed tissue, and should not be connected with the syringe if any blood escapes through it, lest the injection be introduced into a vein. This method has been successfully used in glandular swellings, 5 to 10 minims of the solution for each gland being sufficient in phlegmons of every grade and character, erysipelas, poisoned wounds, inflamed bursæ, hydrocele, acute and subacute rheumatism, chronic synovitis, buboes, relapsing tonsillitis, and in some severe cases of tetanus. Under the trade-name ***Aseptolin*** (see *ante*, page 85) Dr. Edson has recently put forth a solution, containing 2¾ per cent. of carbolic acid and a minute quantity of a pilocarpine salt, for hypodermic use in curable cases of tuberculosis, malaria, and other diseases due to germ infection. There is nothing original in this treatment, it being a repetition of the phenic acid injection of Declat combined with the pilocarpine treatment of phthisis announced about four years ago as the "discovery" of Dr. Waldstein. It has gone through the usual puffing methods of trade promotion, and the few independent reports upon its use show no evidence of any special merit for it in these diseases.

Internally, Carbolic Acid is not much employed. It has been given to relieve flatulence and dyspepsia, and is often an efficient remedy against vomiting. It has proven of considerable temporary benefit in diabetes of hepatic origin; and has been used against intermittents, typhoid fever and various zymotic diseases; but is probably of no efficacy in constitutional affections. A mixture containing carbolic acid and spirit of chloroform has been lately used as an internal remedy for typhoid fever by Dr. Quill, of the Indian army, without the loss of a single case, and in a country where enteric fever has a very high rate of mortality.

In phthisis and other chronic pulmonary diseases, Carbolic Acid has been much employed as a spray by inhalation, and certainly does do good therein by relieving cough and irritation of the throat. In these affections, Creosote is preferred to it both for internal and local use. An acute conjunctivitis is greatly relieved by holding the open eye in the spray of a steam atomizer, the cup of which contains a 5 per cent. solution of carbolic acid. This measure may also be used for acute coryza with beneficial results; or a mixture of Carbolic Acid and Tincture of Iodine may be dropped on to a sponge in a wide-mouthed bottle and volatilized for inhalation by being wrapped in a cloth wrung out of hot water, or even by being held in the hand.

The Sulpho-carbolates of Sodium, Potassium, etc., have been employed internally with advantage in the septic diseases, as the exanthemata, diphtheria, puerperal fever, etc., with the object of obtaining the antiseptic action of carbolic acid without the dangers attending its use in efficient doses. They may be used locally with good results in aphthæ, tonsillitis, otorrhea, gonorrhea, and for inflamed mucous membranes generally.

Creolin was highly vaunted, by Professor von Esmarch and other authorities, as the ideal antiseptic for external use, being possessed of great germicidal power, and a most efficient deodorant and disinfectant, while its absorption caused no toxic results whatever. Experience has justified these claims in the main, but the drug has, however, given rise to serious symptoms, when used to excess. As a vaginal wash, in puerperal cases, the 2 per cent. solution is reported as fully equal to sublimate solutions, while better as a deodorant, and free from danger by absorption. The weaker solutions have given satisfaction as local applications in the treatment of otorrhea, nasal ulcers, rhinitis (1 to 1000), blepharitis, keratitis, etc.; and in female cystitis a 1 per cent. solution as a vesical wash, gradually increased to 2 per cent., is highly praised by Parvin. The Ointments and Gauze are used for wounds and other solutions of continuity, in the same manner as carbolized preparations, and with better satisfaction, Creolin being less volatile than Carbolic Acid, and of a more agreeable, though powerful, odor. Internally it has been employed in gastric fermentation, dysentery, and typhoid fever.

Lysol is said to be superior to carbolic acid, creolin and the other analogous coal-tar products as a germicide, but it has no advantage over the antiseptics of established reputation; and is only really efficient in solutions of such strength as to be irritating or caustic. Although not destined to play any great part in surgery, it may be useful in the prophylaxis and arrest of epidemics; and is likely to be particularly serviceable in the disinfection of premises, privies, ships and stables, being readily soluble, reasonably active, and very cheap (Squibb). Dr. Pee, who has had very favorable results from Lysol, recommends a 1 per cent. solution in obstetrics and gynecology, and says that a solution of one part in 200 destroys streptococci in fifteen minutes.

Trikresol possesses very high germicidal power, and is said to be practically non-toxic and less irritating to wounds than either carbolic or sublimate solutions. A 1 in 1000 solution dropped into the eye did not produce the slightest irritation, and the 1 to 500 solution dropped into my own eyes produced no burning sensation whatever (De Schweinitz). These solutions may therefore be advantageously employed as menstrua for the stock collyria, especially for those of cocaine, physostigmine and atropine, which are most liable to contamination. Trikresol is particularly fatal to pyogenic cocci, a 1 per cent. solution invariably killing them in half a minute in watery solutions, and in a minute and a half in rich albuminous fluids (Grüber).

Phenosalyl is said to possess antiseptic power which is considerably superior to that of carbolic acid, a 1 per cent. solution immediately killing the staphylococcus pyogenes aureus, the most resistent microbe known. In order to attain the same result with carbolic acid it is necessary to expose the staphylococcus to the action of a 2½ per cent. solution for at least one minute. Phenosalyl does not irritate the skin, has no corrosive action on instruments, is very soluble in water, is non-toxic, and leaves a pleasant and non-persistent odor which does not cling about the hands or the clothes. Its solutions have no corrosive action on the skin, and the mucous surfaces treated with it remain smooth and slippery and do not become dried up, as is the case after washing with carbolic acid or corrosive sublimate solutions (Fränkel).

ACIDUM CARBONICUM, Carbonic Acid, *Carbon Dioxide,* CO_2 (Unofficial). The body which is commonly called Carbonic Acid, but should be called *Carbon Dioxide,* is a colorless and odorless gas, of sp. gr. 1.526, slightly sharp taste, soluble in its own volume of pure water at the ordinary temperature and pressure, much more soluble under increased pressure and lowered temperature of the water, also more soluble in water containing phosphates. In water it promotes the solution of phosphates and carbonates. Its aqueous solution gives an acid reaction, and is "sparkling" from rapid escape of the gas, especially when agitated. It is prepared by treating any carbonate (usually calcium carbonate in the form of marble-dust) with dilute hydrochloric acid; the resulting gas is passed into water under pressure, and the solution is thus obtained.

Carbon Dioxide occurs in the atmosphere in the proportion of 2 to 6 parts in 10,000, also in all water in varying quantity. Certain sparkling waters contain it in the proportion of more than one half their volume, Johannis having more than 90 per cent. It occurs also in all the liquids of the body, especially in the blood, originating in the oxidation processes which are constantly taking place in the tissues, and readily passing by osmosis through animal membranes. It is continuously produced by the action of the yeast-plant, and by all other fermentation processes, and accumulates in brewers' vats, old wells, some caves, grottoes and deep valleys, also in mines, forming the well-known "choke-damp" of miners. It is constantly evolved during respiration and in the burning of gas, fires, etc. When the air of a room contains 0.1 per cent. of this gas it is unfit for continued respiration.

True *Carbonic Acid,* CO_3H_2, or Hydrogen Carbonate, is an organic acid which is not known in the separate state, but only in aqueous solution. It is supposed to exist in a solution of carbon dioxide in water.

Preparation.

Aqua Carbonata, *Carbonated Water, Soda-water* (Unofficial),—is water highly charged with carbonic acid gas, the excess of gas being dissolved in the water by pressure, and escaping in bubbles when the pressure is taken off. It was official in the U. S. P., 1870, under the title Aqua Acidi Carbonici, the formula requiring that the water be charged with five times its volume of gas, for which a pressure of five atmospheres is required.

Carbonated Mineral Waters.

Selters, Nassau, Germany, ...	30 cubic inches	of CO_2 to the pint.
Apollinaris, Neuenahr, Prussia, ...	47 "	
Old Sweet Spring, West Virginia, ...	11 "	
Sweet Chalybeate Spring, Virginia, ...	13 "	

There are 10 official Carbonates and 2 official Bicarbonates, which are severally described under their basylous titles.

PHYSIOLOGICAL ACTION.

Carbon Dioxide is highly antiseptic and preservative. D'Arsonval employs it, under 30 atmospheres pressure, for the sterilizing of orchitic extract. Beef will remain perfectly fresh and its taste unchanged for eight days if hung in a chamber filled with the gas. Externally, applied to the skin, mucous membranes or wounded tissues, the undiluted gas produces slight hyperemia, with prickling and a sense of heat, followed by a certain degree of local anesthesia. Internally, given by the stomach in aqueous solution, it is refreshing and quenches thirst, slightly stimulates the heart's action, quickens respiration and causes a brief sense of exhilaration. It increases somewhat the gastro-intestinal secretions and excites peristalsis, but diminishes the sensibility of the mucous lining of the alimentary canal. Inspired, the gas is highly toxic, a proportion of 10 per cent. thereof in the air being irrespirable and fatal. Even 0.1 per cent. produces unpleasant symptoms, as headache, sleeplessness and depression; 0.3 per cent. causing a throbbing headache, fulness and tightness across the temples and giddiness; and a larger quantity profoundly affects the nervous system, inducing fainting, muscular weakness, somnolence or insensibility, and coma or convulsions. The inhalation of the undiluted gas at first excites irritation and sometimes spasmodic closure of the glottis with consequent asphyxia, but in any case it soon arrests the respiration. It hinders the exhalation of the carbon dioxide normally existing in the blood, and is itself absorbed in small quantity, inducing dyspnea, cyanosis, slow and labored pulse, and ultimately arrest of the heart's action. In toxic quantity it abolishes at once the functions of nerve and muscle by stopping the process of oxidation in the tissues.

The symptoms of Carbon Dioxide poisoning may be divided into three stages, which are the stages of *Asphyxia*. They are: (1) that of *dyspnea*, in which the blood pressure rises from excitation of the centres in the medulla by the venous blood, the vessels of the surface become dilated, and insensibility comes on; (2) that of *convulsions*, in which the respiratory movements become more violent and spread to all the muscles of the body; (3) that of *paralysis*, in which the convulsions cease, the blood pressure falls, the respiration gradually fails, and finally the heart stops. The autopsy shows great venous congestion everywhere, the right side of the heart distended with blood, the brain much congested, with exudation and even extravasation therein, and the blood exceedingly dark in color.

Treatment of Carbon Dioxide Poisoning.

The antagonists are *Oxygen* and stimulants of the peripheral circulation. The prime object of treatment is to get the blood oxygenated as quickly as possible. The patient should be brought at once into the open air, and if the respiratory movements have ceased, cold water should be dashed on the face and chest, in order to awaken them by reflex action. If no effect is thereby produced, recourse must be had to *artificial respiration*, which should be maintained for at least an hour. [Compare the article entitled ASPHYXIA AND APNEA in Part III.] If the heart does not begin to beat shortly after artificial respiration has been begun, the jugular vein should be opened, with care to prevent the entrance of air, in order to relieve the distention of the right ventricle and prevent the consequent paralysis of the heart. This vein is selected because there are no valves of any importance between it and the heart. A series of sharp, quick blows upon the chest in the cardiac region will sometimes start the heart into action after it has stopped.

THERAPEUTICS.

Carbon Dioxide has been locally employed as a stimulant in ulcers and as an anesthetic in cancers, either by directing a stream of the gas upon the part or by the application of a yeast poultice. It has been applied to the eyes, ears, nose, vagina and rectum, in catarrhal inflammations of these parts, also to the bladder, for irritability of that viscus, and its application is beneficial when there is no acute inflammation present. It is injected into the vagina with good results in dysmenorrhea and in many other painful affections of the pelvic viscera, whether neuralgic in character or arising from organic disease. Diluted with 90 to 95 per cent. of air, its inhalation is serviceable in chronic laryngitis and pharyngitis, also in asthma, chronic bronchitis and chronic cough.

Carbonated water, or *Soda-water* as it is popularly named, is a grateful beverage in warm weather, especially when flavored with certain syrups and fruit juices. It is a useful drink in febrile affections, as it relieves thirst, allays nausea and gastric irritability, and is both diaphoretic and diuretic in slight degree. It is an efficient remedy for vomiting, and in the form of iced champagne is one of the numerous agents which have proven efficacious in the vomiting of pregnancy. It forms an excellent vehicle for the administration of saline cathartics, the various carbonates and piperazin. The free use of carbonated mineral waters is of service in gout, especially when they contain the salts of lithium in solution. At many European spas the course of treatment is largely based on the use of carbon dioxide, administered in the forms of baths and inhalations as well as by the ingestion of the waters containing it. Bathing in the natural carbonated waters is sometimes beneficial in catarrh, gout, rheumatism, anemic amenorrhea and leucorrhea, the gas acting as a gentle stimulant of the cutaneous circulation and promoting slight diaphoresis. [Compare the article entitled AQUA.]

ACIDUM CHROMICUM, Chromic Acid, *Chromic Trioxide*, *Chromic Anhydride*, CrO_3,—is obtained by the action of Sulphuric Acid upon Potassium Bichromate, and occurs in small, crimson, needle-shaped crystals, which are deliquescent and very soluble in water. This substance is not true Chromic Acid, which does not occur in the free state, and the formula of which would be H_2CrO_4. It should be known by one of the chemical synonyms mentioned above. It should he kept in glass-stoppered bottles, and great caution should be observed to avoid bringing it in contact with organic substances, such as cork, tannic acid, sugar, alcohol, glycerin, etc., as dangerous accidents are liable to result. It is not used internally.

Potassii Bichromas, *Potassium Bichromate,* $K_2Cr_2O_7$,—large, orange-red prisms of disagreeable, metallic taste and acid reaction, soluble in 10 of water at 59° F., and in 1½ of boiling water, insoluble in alcohol. It is used locally in aqueous solution (gr. v–ʒj to the ℥), and internally in doses of gr. $\frac{1}{10}$–gr. ij in trituration.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Chromic Trioxide is a powerful escharotic and penetrates deeply, but it is slow of action and is not very painful. It coagulates albumin and parts readily with its oxygen, oxidizing organic matter and decomposing ammonia and sulphuretted hydrogen; and is therefore an energetic disinfectant and deodorizer. When used as a caustic it is mixed with sufficient water to make a paste, which may be employed for the destruction of warts, hemorrhoids and other superficial growths; the neighboring parts being protected by cotton soaked in a strong alkaline solution. For syphilitic warts and condylomata, lupus, tinea tonsurans, etc., a solution of 100 grains to the ℥ of distilled water is generally used. A solution of 1 in 40 is an excellent and inexpensive antiseptic lotion for putrid sores and wounds, syphilitic affections of the tongue, mouth and throat, ozena, leucorrhea and gonorrhea. In uterine catarrh and hemorrhages a solution of 120 grains to the ℥ has been injected into the uterine cavity with good results.

Potassium Bichromate is a good antiseptic and escharotic of milder action than the trioxide. In doses of ʒij–iv it has proved fatal to life in adults, with symptoms of gastro-enteritis, suppression of urine, and cardiac paralysis. It is chiefly employed as a local application in saturated solution to warts and venereal condylomata; and in dilute solution (gr. j–x to the ℥) for catarrhal conditions of the nasal, buccal or vaginal mucous membrane. Internally it has been employed with benefit in locomotor ataxia and in dyspepsia simulating gastric cancer; also in chronic gastric catarrh, the tongue having a thick yellow coat, in chronic diarrhea from intestinal ulceration, and in chronic ulcers of the pharynx and mouth. It is a good remedy in syphilitic sore throat, local rheumatism of the fibrous tissues, periosteal and syphilitic rheumatism, and acute catarrh and influenza, chronic nasal catarrh, chronic laryngitis, and chronic catarrhal affections of the bronchial mucous membrane, especially when the expectoration is tough and stringy. It has also been used with some success in diphtheria. In pharmacy it is employed in preparing Chromic Acid and Valerianic Acid, and as a test solution. Most of the medical galvanic and faradic batteries are run by a mixture of this salt with sulphuric acid. *Poisoning* by it should be treated as directed for mineral acids

ACIDUM FLUORICUM, Fluoric Acid, HF (Unofficial),—is a strong escharotic, acting deeply and leaving a dry and painful slough. The dilute acid (1 in 200) is prepared by acting on fluor spar by Sulphuric Acid, the resulting gas being dissolved in water. Its dose is ♏xx–xxx, well diluted.

Dilute Fluoric Acid has been successfully used as an internal remedy in goitre, and the gas has been inhaled with benefit in laryngeal diphtheria.

ACIDUM GALLICUM, Gallic Acid, $HC_7H_5O_5.H_2O$,—is a nearly colorless solid in long needles and triclinic prisms, having a slightly acid and astringent taste, soluble in 100 of water and in 5 of alcohol at 59° F., and in 3 of boiling water. It is prepared from a paste of powdered galls (see GALLA), by fermenting for six weeks, boiling and reboiling in water, filtering and crystallizing. According to some authorities, the Tannic Acid of the galls is split up into Gallic Acid and glucose by fermentation; but according to others the glucose is an impurity and the Tannic Acid is simply converted into two parts of Gallic Acid, $C_{14}H_{10}O_9 + H_2O = (HC_7H_5O_5)_2$. Dose, gr. v–xv, in solution, pill or powder.

Acidum Tannicum, *Tannic Acid, Gallotannic Acid, Digallic Acid, Tannin,* $HC_{14}H_9O_9$,—is a solid body in light-yellowish scales, of strongly astringent taste and acid reaction, obtained from powdered galls (see GALLA), by exposure for three days in a damp atmosphere, then macerating with ether, pressing, and drying the liquid portion. It is soluble in 1 of water, in 0.6 of alcohol, at 59° F., and in about 1 of glycerin with moderate heat; very soluble in boiling water and in boiling alcohol, almost insoluble in ether, chloroform, benzol or benzin. Dose, gr. j–xx, in wafer, pill or capsule.

Preparations.

Unguentum Acidi Tannici, *Ointment of Tannic Acid,*—is a 20 per cent. ointment, made with Benzoinated Lard.

Trochisci Acidi Tannici, *Troches of Tannic Acid,*—each troche contains nearly one grain of Tannic Acid.

Glyceritum Acidi Tannici, *Glycerite of Tannic Acid,*—has a strength of 1 part in 4 of Glycerin.

Suppositoria Acidi Tannici, *Suppositories of Tannic Acid* (Unofficial),—have 1 part of Tannic Acid in 5 of Cacao Butter.

Collodium Stypticum, *Styptic Collodion,*—has of Tannic Acid 20, Alcohol 5, Ether 25, Collodion to make 100 parts.

Vegetable Astringents contain some form of Tannic Acid, as *Quercitannic Acid* from *Oak-bark*, *Rhatania-tannic Acid* in *Rhatany*, etc. The official acid is *Gallotannic Acid*, being that produced from Galls. These astringents depend for their medicinal value upon the Gallic and Tannic Acids contained in them. Such are—

Alnus, *Alder Bark.*
Castanea, *Chestnut.*
Catechu, *Catechu.*
Diospyros, *Persimmon.*
Galla, *Nut Galls.*
Geranium, *Cranesbill.*
Granatum, *Pomegranate.*
Hamamelis, *Witch Hazel.*
Hæmatoxylon, *Logwood.*
Heuchera, *Alum Root.*
Kino, *Kino.*
Krameria, *Rhatany.*
Myrica, *Wax Myrtle.*
Nymphæa, *Pond Lily.*
Quercus Alba, *Oak Bark.*
Rosa Gallica, *Red Rose.*
Rubus, *Blackberry.*
Statice, *Marsh Rosemary.*

Physiological Action and Therapeutics.

Gallic Acid, and its congener Tannic Acid, are astringents, the former being the feebler of the two. They differ in that tannic acid coagulates albumin and gelatin, while gallic acid does not. According to some authorities the difference between gallic and tannic acids is one of oxidation, according to others of hydration; the latter assuming tannic acid to be simply gallic acid anhydride. They constringe the muscular tissue in the walls of the minute vessels, thus checking secretion and hemorrhages and cutting short local inflammations. Except in enormous doses, they are harmless.

Tannic Acid is a powerful astringent. It precipitates pepsin and coagulates albumin, impairs digestion, stops peristalsis, and causes constipation. A part of that taken into the stomach unites with the pepsin and albumin, while a part is converted into Gallic and Pyrogallic Acids, and in this form is both absorbed and excreted. It is a crystalloidal body, but combines with colloids, and is a valuable antidote in poisoning by the alkaloids and tartar emetic, with which it forms tannates which are nearly insoluble. Its continued use disorders digestion, irritates the mucous membranes, and produces emaciation. Injected into the veins it forms emboli and thus may cause death, but by the stomach it is non-toxic. Tannic Acid is a more powerful astringent than Gallic Acid, and hence it is preferred for local use and for astringent effect on the intestinal canal. It is well employed in hemorrhoids and hemorrhages from the lower bowel, in hematemesis, epistaxis, rectal ulcers or fissures, catarrhs and chronic affections of the mucous membranes, endocervicitis, conjunctivitis, dysentery and diarrheas, eczema, impetigo and other forms of skin-disease, otorrhea, bed-sores, prolapsus ani, and many other affections.

Styptic Collodion is used to stanch the bleeding from an open wound, to unite and protect incised or lacerated wounds, and to cover and change the character of foul ulcers.

Gallic Acid is preferred to Tannic Acid when an astringent action is desired upon remote parts, as the lungs, kidneys, etc., which can only be reached through the circulation. In hematuria, distant passive hemorrhages, albuminuria, diabetes insipidus, bronchorrhea, night-sweats, chronic diarrhea, and chronic cystitis, it is a most useful remedy.

Mineral Acids, Alkalies, per-salts of Iron and salts of Antimony, Lead, and Silver are chemically incompatible with preparations containing Tannic or Gallic Acid. Vegetable Alkaloids and Gelatin form insoluble precipitates with Tannic Acid.

Gallobromol, *Dibromogallic Acid*, $C_6Br_2(OH)_3COOH$, (Unofficial),—occurs in small white, needle-shaped crystals, soluble in 10 parts of lukewarm water. The solution gradually darkens and after a few days becomes brown. Lepine states its internal action as similar to that of potassium bromide. In 1 or 2 per cent. solutions it has been used with remarkable success as a local application in gonorrhea of all stages. It seems to readily destroy the gonococcus.

Pyrogallol, *Pyrogallic Acid*, *Tri-hydroxy-benzene*, $C_6H_3(OH)_3$,—is a triatomic phenol, obtained chiefly by the dry distillation of Gallic Acid. It occurs in light, white, shining laminæ, or fine needles, of bitter taste; soluble in water, alcohol and ether. Dose, gr. j–ij.

Pyrogallol may act as an intense poison. It has been absorbed from the surface with fatal results, preceded by vomiting and diarrhea, rigors and fever, black urine full of globulin, and disorganization of the blood-corpuscles. It has great affinity for oxygen and may be used as an antiseptic and disinfectant in 1 to 2½ per cent. solutions. It has been used internally in two-grain doses for internal hemorrhages. As an ointment (ʒj–℥j) it ranks next to Chrysarobin as an efficient palliative in psoriasis, and has been used with good results in lupus and epithelioma, being supposed to attack the diseased nodules only, leaving the adjacent skin uninjured.

Tannigen *Diacetyl-tannin* (Unofficial),—is an acetic acid ester of tannin, prepared by the action of glacial acetic acid on tannic acid. It occurs as an odorless and tasteless powder, insoluble in cold water and dilute acids, but soluble in cold alcohol and in dilute solutions of soda, sodium phosphate and borax. It is said to pass through the stomach unchanged and to be gradually decomposed in the intestines, thus exerting an astringent effect upon the entire intestinal canal. Its uses have been those of an intestinal astringent. It appears to be absolutely innocuous. Dose, gr. iij–viij, up to ʒij daily.

ACIDUM HYDROCHLORICUM, Hydrochloric Acid, *Muriatic Acid*,—is a liquid composed of about 32 per cent. of absolute Hydrochloric Acid Gas, HCl, and 68 per cent. of water. It is colorless and fuming, of specific gravity 1.163, pungent odor, intensely acid reaction and taste, and is obtained by the action of Sulphuric Acid upon Sodium Chloride, the resulting gas being carried through water, which dissolves it. It is sometimes used as a caustic. Its union with basic substances forms salts, called Hydrochlorates (Muriates), of which four are official, viz.—Apomorphine, Morphine, Pilocarpine, and Quinine Hydrochlorates, described under the title of their respective bases.

Acidum Hydrochloricum Dilutum, *Diluted Hydrochloric Acid*,—is a 10 per cent. solution of the absolute acid in water. Dose, ♏iij–x.

Acidum Nitro-hydrochloricum, *Nitro-hydrochloric Acid*,—is described under ACIDUM NITRICUM.

PHYSIOLOGICAL ACTION OF THE MINERAL ACIDS.

The mineral acids (Hydrochloric, Sulphuric, Nitric, Nitro-hydrochloric, and Phosphoric) resemble each other in general action so closely that they may all be described in this place.

The strong acids are escharotic, abstracting the waters of the tissues, combining with the albumin and other bases, and destroying the protoplasm. They are very diffusible, redissolving the albumin after precipitating it (except Nitric Acid). Sulphuric and Phosphoric have a strong affinity for water, completely decomposing tissues to which they are applied, and are therefore the most powerfully escharotic. Nitric Acid does not readily redissolve the albumin precipitated by it, which thus forms a barrier against the deep action of the acid. Sulphuric Acid chars or carbonizes the tissues black, while Nitric and Hydrochloric tan them yellow.

The dilute acids produce a peculiar taste in the mouth and a sensation of roughness on the teeth. They stimulate the flow of saliva from the parotid and submaxillary glands, but have no action on the sympathetic saliva. They promote the alkaline intestinal secretions and excite the flow from glands having an alkaline secretion (bile, etc.), when applied to the mouths of their ducts, but check that from those whose secretion is acid (gastric, etc.). Secretion generally is promoted by Nitric Acid, and lessened by Sulphuric, Hydrochloric acting between the other two. Given before meals, in small doses, they relieve acidity of the stomach by checking the production of the acid gastric juice. At first they aid digestion, being synergistic to the action of pepsin, but if continued they impair digestion by lessening the production of the gastric juice. They check fermentation and constipate the bowels, except Nitric Acid, which relaxes them. They render the urine slightly more acid than its normal reaction, but do not acidify alkaline urine as the vegetable acids do. They are all astringent to the tissues, Hydrochloric being the weakest and Sulphuric the strongest in this respect.

Antidotes and Antagonists.

Alkalies to neutralize the acid; *Oil*, *Albumin*, or *Milk*, to protect the mucous membrane; Stimulants, *Opium*, *Ammonia* (intravenously), to combat the resulting depression of the vital powers.

THERAPEUTICS OF THE MINERAL ACIDS.

All the members of this group are useful in fevers, if well diluted, Hydrochloric being usually preferred, especially in typhoid. In atonic dyspepsia, acidity of the stomach, and locally in ulcerations of the throat, Hydrochloric Acid is best used. Nitric is the acid generally preferred as a caustic, its action being effectual and superficial. As such it is applied undiluted to phagedenic ulcers and sloughs, warty growths, and to the cavity of the womb in chronic inflammation thereof. Dilute Nitric Acid is used internally in oxaluria and lithemia, intermittent and remittent fevers, and aphonia of singers. Dilute Nitro-hydrochloric is more suitable in chronic hepatic disorders due to malaria; Sulphuric in hemorrhages, diarrheas, colliquative sweating, and as a prophylactic against lead-poisoning. Dilute Sulphuric Acid is used as an acid drink in fevers, and before meals in acidity of the stomach. It is very doubtful whether the latter has any special influence on the nervous or osseous systems.

All these acids act injuriously on the teeth, by attacking the enamel. They should always be administered largely diluted, taken through a straw or glass tube, and the mouth should be thoroughly rinsed at once with an alkaline wash.

ACIDUM HYDROCYANICUM DILUTUM, Diluted Hydrocyanic (Prussic) Acid,—is a liquid composed of 2 per cent. of absolute Hydrocyanic Acid, HCN, and 98 per cent. of water. It is colorless, faintly acid, of peculiar odor, and is prepared by distilling solutions of Potassium Ferrocyanide and Sulphuric Acid together, or extemporaneously by adding 6 grammes of Silver Cyanide to a solution of 5 cc. of Hydrochloric Acid in 55 of distilled water, shaking together and pouring off the supernatant liquid. ♏xl have proved fatal. Dose, ♏j–v, of a recent preparation; as, even under the most favorable conditions, it will decompose within a year.

Preparations containing Hydrocyanic Acid.

Aqua Laurocerasi, *Cherry-laurel Water* (Unofficial),—is a water distilled from the fresh leaves of *Prunus laurocerasus*, the common Laurel or Cherry Laurel, a small tree of the nat. ord. Rosaceæ, sub-order Amygdaleæ. The leaves contain a variable amount of Hydrocyanic Acid and a volatile oil. Dose, ♏v–xxx, cautiously.

Scheele's Dilute Hydrocyanic Acid (Unofficial),—is a 4 or 5 per cent. solution, and is highly dangerous even by inhalation.

Amygdala Amara, *Bitter Almond* (see its title) and its essential oil; also, various other members of the sub-order Amygdaleæ, including the official *Prunus Virginiana*, perhaps the unofficial *Prunus laurocerasus*, and the leaves and kernels of the peach and cherry trees, contain a proximate principle *Amygdalin*, and a ferment *Emulsin*, which in the presence of water react on each other, forming Hydrocyanic Acid, a volatile oil, and glucose. $C_{20}H_{27}NO_{11}$ (Amygdalin) $+ 2H_2O = C_7H_6O$ (Oil of Bitter Almond) $+$ HCN (Hydrocyanic Acid) $+ 2C_6H_{12}O_6$ (Glucose).

Hydrocyanic Acid exists ready formed to a considerable extent in the juice of the bitter cassava.

Other Cyanogen Compounds.

Potassii Cyanidum, *Potassium Cyanide*, KCN,—a white, opaque salt, of alkaline reaction, bitter-almond taste, and a peculiar odor when moist; soluble in 2 of water, sparingly soluble in alcohol. Dose, gr. $\frac{1}{20}$–$\frac{1}{2}$. Locally, a solution of gr. j–v to the ℥ is as strong as should be employed.

Potassii Ferrocyanidum, *Potassium Ferrocyanide*, $K_4Fe(CN)_6 3H_2O$,—large, lemon-yellow prisms or tablets, efflorescent, odorless, of sweetish taste and neutral reaction, soluble in 4 of water, insoluble in alcohol. Employed in pharmacy as a test solution, and in the preparation of Iron Ferrocyanide, Diluted Hydrocyanic Acid and Potassium and Silver Cyanides. Rarely used medicinally. Dose, gr. v–xv.

PHYSIOLOGICAL ACTION.

Hydrocyanic Acid is one of the most powerful and rapid poisons known, half a grain having proved fatal almost immediately. Its action on the organism is one peculiar to itself, the inhalation of a strong preparation producing rapid insensibility and almost immediate exhaustion ;—death from a full dose occurring by sudden paralysis of the heart, from a less but still a fatal dose, by paralysis of respiration. The symptoms are those of sudden and complete asphyxia, but some volitional movements may be made before death, unless the dose be very large. In cases in which the dose, though fatal, permitted of the observance of its effects, they were usually divisible into two marked stages, viz.: (1) dyspnea, slow and full pulse, giddiness, loss of muscular power ;—(2) vomiting, dilated pupils, unconsciousness, spasms, muscular rigidity, and cessation of the heart's action. In poisonous, but not fatal doses, the following effects have been observed : feeble pulse, dilated pupils, turgid and dusky face, insensibility, convulsions or rigidity, but no paralysis. Large medicinal doses may produce salivation, irritation of the throat, dizziness, buzzing in the ears, headache, numbness, dusky countenance, staggering gait, sense of constriction of the chest, palpitation of the heart, a frequent or an abnormally slow pulse; a sense of great weariness and drowsiness. Post-mortem examination usually shows dilated pupils, the eyes having a marked glassy lustre, the cadaveric rigidity very great. The blood, in cases which have been rapidly fatal, may show the arterial color in both the arterial and the venous systems ; but in slower cases it is dark and fluid, engorging both sides of the heart, the venous trunks, and the cerebral sinuses. The paralyzant action of the drug is chiefly exercised on the nerve-centres in the medulla ; next on the peripheral afferent nerves, the spinal cord, the motor nerves, and finally on the muscular tissue. It stops the heart by irritation of the vagus-roots in the medulla, as well as by paralyzing the cardiac motor ganglia. It is said to form with hemoglobin a compound (cyan-hemoglobin), which does not readily give up oxygen. The odor of the acid is fragrant, resembling that of bitter almonds or peaches, and may be detected in the lungs shortly after death. The effects of a medicinal dose pass off in an hour at the farthest.

Locally applied to the skin, Hydrocyanic Acid penetrates the epidermis and paralyzes the end-organs of the sensory nerves in the derma. It is rapidly absorbed from mucous surfaces.

Potassium Cyanide has similar action, but in addition has some few peculiar to itself. Locally used it produces dermatitis, with an eczematous eruption, and if applied to an abraded surface freely may cause fatal effects. Internally it has proved fatal in doses of 3 to 5 grains, with all the symptoms of Hydrocyanic Acid poisoning, but its action is less rapid. It is much used in photography, and many cases of poisoning by it have occurred in persons employed in that art.

Antagonists and Antidotes.

Atropine has antagonistic action, but is too slowly diffused to be of any value. *Ammonia* by inhalation, by the stomach, and by intra-venous injection, with cold affusion to the spine, and artificial respiration, are the measures most likely to avail in cases of poisoning where there is time to do anything. *Ferrous Sulphate* has been considered an antidote against Potassium Cyanide, to form Ferrocyanide of Iron (Prussian Blue), but it is not efficient. *Sodium Thiosulphate* is said to be a good antidote. *Cobaltous Nitrate* is an efficient antidote (Antal).

THERAPEUTICS.

Hydrocyanic Acid is used for its antispasmodic and sedative effects. In vomiting, whooping-cough, and coughs of spasmodic character, in asthma and other neuroses of the respiratory organs, in affections involving the pneumogastric nerve, vertigo and headache from stomachal derangements, gastralgia, painful dyspepsia, vomiting, etc., it is very efficient as a palliative. In acute mania and melancholia it has been used with advantage; and in various skin diseases, accompanied by itching, tingling, etc., its use as a lotion (♏xxx–ℨj ad ℥j Aquæ Rosæ) to the unbroken surface is prompt in relieving the pruritus and other distressing sensations. Only when recently prepared is it of any service; as, even under the most favorable conditions, it will undergo decomposition within a year.

Potassium Cyanide in ointment (gr. v ad ℥j) is used to allay pruritus, and in solution (gr. iij–v ad ℥j) is applied locally with benefit in reflex headaches, and is used as a wash to remove nitrate of silver stains. It has been used internally in doses of gr. j for acute articular rheumatism, but such employment of it is highly dangerous. In smaller doses (gr. 1/6–1/4), it is a useful ingredient of cough mixtures, where Opium or its alkaloids are not admissible.

Potassium Ferrocyanide has been used in doses of 8 to 15 grains as an astringent and anodyne, but it is seldom employed in medicine.

Cherry-laurel water has been extensively used as a flavoring agent, having a very agreeable taste. It is official in the British Pharmacopœia, and is supposed to be a rather elegant mode of administering Prussic Acid; but the uncertainty of its strength is such that it should never be used internally, except in very small quantities. It has been employed as an anesthetic injection into the urethra prior to catheterization, and was formerly employed by ophthalmologists as an eye-wash in painful affections of that organ.

ACIDUM LACTICUM, Lactic Acid,—is a liquid composed of 75 per cent. of absolute Lactic Acid ($HC_3H_5O_3$) and 25 per cent. of water; nearly colorless, syrupy, odorless, of acid taste and reaction, freely miscible with water, alcohol and ether, but nearly insoluble in chloroform. It is produced by the lactic fermentation of sugar of milk or grape sugar, has a sp. gr. of 1.213, and is difficult to obtain pure. It enters into Syrupus Calci Lactophosphatus. Dose, ℨss–℥ss, well diluted.

Lactic Acid is found in the stomach as the product of the food, and combines with bases in the blood, forming lactates, which, being oxidized, are converted into carbonates. It aids digestion and promotes the appetite, but in large doses causes flatulence and much epigastric pain. Injected into the peritoneal cavity of animals, it excites endocarditis, and given in diabetes it has produced acute rheumatism and rheumatic endocarditis. Hence its supposed causation of acute rheumatism when in excess and free in the blood. It dissolves false membranes and also calcium phosphate. Hypnotic properties have been ascribed to it.

Lactic Acid is used with benefit in diabetes, atonic dyspepsia, oxaluria, and in the lithic and phosphatic diatheses when due to imperfect digestion and assimilation. As a solvent of false membrane in diphtheria it is unquestionably of great service but painful. In chronic cystitis it arrests the ammoniacal decomposition of the urine. As the acid found in the shops is generally of poor quality, disappointment in its use may be expected.

ACIDUM NITRICUM, Nitric Acid,—is a liquid composed of 68 per cent. of absolute Nitric Acid, HNO_3, and 32 per cent. of water. It is colorless, fuming, very caustic and corrosive, of sp. gr. 1.414, strongly acid in reaction, and is obtained by the action of Sulphuric Acid on Potassium Nitrate. It is only used externally as a caustic.

Preparations.

Acidum Nitricum Dilutum, *Diluted Nitric Acid*,—has of the above 10 parts in 58 of Distilled Water, and contains 10 per cent. of absolute Nitric Acid. Dose, ♏iij–xv, well diluted.

Acidum Nitrohydrochloricum, *Nitrohydrochloric Acid*, *Nitromuriatic Acid*, *Aqua Regia*,—a golden-yellow, fuming, corrosive liquid, composed of Nitric Acid 18 vols., Hydrochloric Acid 82 vols. Is wholly volatilized by heat, usually dissolves gold-leaf, and a drop added to test-solution of potassium iodide liberates Iodine in abundance. Dose, ♏j–viij, well diluted.

Acidum Nitrohydrochloricum Dilutum, *Diluted Nitrohydrochloric Acid*,—consists of Nitric Acid 4, Hydrochloric Acid 18, Water 78 vols. Dose, ♏v–xx, well diluted.

The action and uses of these agents described with those of the other mineral acids, under the title ACIDUM HYDROCHLORICUM. Some special properties are as follows:—

Nitric acid is an exceedingly powerful escharotic, but, as it coagulates and does not redissolve the albumin of the tissues, it forms a barrier to its own excessive action. The vapor may cause edema of the glottis, intense bronchitis, etc., and death from suffocation. It is used for the destruction of chancres, warts, hemorrhoids, phagedenic ulcers, etc.; and internally in dilute form for bilious affections, as it is supposed to have a selective action on the liver. It also lessens phosphatic deposits in the urine, and acts as an astringent in the system, diminishing profuse secretion in bronchorrhea and phthisis.

Nitrohydrochloric Acid is also supposed to specially affect the liver. It is usefully employed in jaundice, dyspepsia, and the so-called bilious condition; also in acidity of the stomach and in frontal headache situated just above the eyebrows when unaccompanied by constipation. In hepatic disorders it may be used in dilute form as baths, or applied to the hepatic region on compresses. The official dilute acid is of little use therapeutically, as it rapidly deteriorates, and the same is true of the strong acid when old enough for the color to change to a lemon-yellow. The most efficient is the strong acid freshly prepared, which is of an orange-red color. This should be properly diluted when required for use, and should be constantly protected from light.

ACIDUM OLEICUM, Oleic Acid, $HC_{18}H_{33}O_2$,—is one of the constituent acids of oils and fats, obtained commercially as a secondary product in the manufacture of stearin candles. It is a yellowish, oily liquid, semi-solid at 39° F., odorless, tasteless, and of neutral reaction, insoluble in water but soluble in alcohol, chloroform, benzol, benzin, turpentine, and the fixed oils. It dissolves most of the metallic oxides and the uncombined alkaloids, forming the so-called Oleates, which, however, are not pure chemical compounds, but merely compounds of an oxide or an alkaloid, as the case may be, with oleic acid, dissolved in a great excess of the latter. Three of these are official, viz.—

Oleatum Hydrargyri, *Oleate of Mercury,*—has 20 of the Yellow Oxide of Mercury with 80 of Oleic Acid.

Oleatum Veratrinæ, *Oleate of Veratrine,*—has 2 of Veratrine in 98 of Oleic Acid.

Oleatum Zinci, *Oleate of Zinc,*—has 4 of Zinc Oxide in 95 of Oleic Acid.

Unofficial Preparations.

Oleates (Oleata) of *Aconitine* (2 per cent.), *Atropine* (2 per cent.), *Morphine* (10 per cent.), *Morphine and Mercury* (2 per cent. morphine and 20 per cent. mercuric oxide), *Quinine* (25 per cent.), *Strychnine* (2 per cent.), *Arsenic* (gr. xx of arsenic oleate to the ℥), *Aluminum*, *Bismuth*, *Copper*, *Iron*, *Lead*, *Silver*, etc., are prepared by the manufacturing pharmacists, and are to be obtained in the shops. Most of them answer to the description given above, but several are Oleo-palmitates, or double salts of Oleic and Palmitic Acids, being prepared from oils which yield the latter acid in considerable quantity. Drs. Shoemaker and Wolff, of Philadelphia, have introduced, under the above names, several solid or semi-solid preparations, which they claim to be chemically true oleates, salts having no excess of either their acids or basic radicles. They are produced by the double decomposition of sodium oleates with solutions of neutral salts, the precipitates, washed and dried, being the oleates required. These oleates are claimed to be more stable than the official oleic solutions, and having less oleic acid are much less costly. Many of them may be used as dusting powders, or mixed with oil or lard to form ointments.

Oleic Acid is used only in making the Oleates, which were introduced by Marshall as substitutes for ointments, being cleaner, more elegant, and more penetrating, but decidedly more irritating if applied with friction. Their medicinal properties depend upon the bases employed, hence their actions and uses will be described under the corresponding basic heads. They should usually be diluted with an equal bulk of vaselin or olive oil before being rubbed into the skin, as they may produce a cutaneous eruption or even pustulation. As a rule, they should be lightly spread over the surface with the finger or a brush. As parasiticides, the Oleates of Copper and Mercury are most efficient, and in skin diseases generally these preparations are rapidly gaining favor.

ACIDUM PHOSPHORICUM, Phosphoric Acid,—is a liquid composed of 85 per cent. of Orthophosphoric Acid, H_3PO_4, and 15 per cent. of water, and is obtained by oxidizing phosphorus with nitric acid. It is strongly acid, odorless, colorless, and of sp. gr. 1.710 at 59° F.

Acidum Phosphoricum Dilutum, *Diluted Phosphoric Acid,*—has of Phosphoric Acid 10 parts in 75 of Distilled Water, and contains 10 per cent. of Orthophosphoric Acid. Dose, ♏v–xxx, in sufficient water.

Phosphates of Ammonium, Ferrum, and Sodium, also the Glycero-phosphates, Syrupus Ferri, Quininæ et Strychninæ Phosphatum, and Acidum Hypophosphorosum Dilutum, are described under PHOSPHORUS.

The action and uses of Phosphoric Acid are described with those of the other mineral acids under ACIDUM HYDROCHLORICUM. It may be given in larger doses than these other acids without deranging digestion, and is therefore preferred in cases requiring acid treatment for a long period, as in diabetes, etc. It is considered of especial value in strumous affections, and it is thought to diminish the growth of osseous tumors, and to dissolve phosphatic deposits. As it contains no free phosphorus it cannot be used to obtain the effects of that drug.

ACIDUM PICRICUM, Picric Acid, *Carbazotic Acid, Trinitrophenol,* $C_6H_3(NO_2)_3O$ (Unofficial),—is obtained by the action of Nitric Acid on Carbolic Acid or many other substances. It is an efficient test for albumin and sugar in the urine. A saturated solution is used locally in erysipelas and burns with great advantage. Some of its salts (Picrates of Ammonium, Iron, etc.) have been tried therapeutically, without any particular results. Antiperiodic and anthelmintic properties and power against trichinæ have been urged for it, but experience has not supported these claims. Dose, gr. v–xv per diem.

Ammonium Picrate, in doses of gr. ⅛ to gr. jss, in pill four times daily, has been used in the malarial fevers of India, in over 10,000 cases with most effective results.

ACIDUM SULPHURICUM, Sulphuric Acid,—is a strongly caustic and corrosive liquid, oily, inodorous, of strongly acid reaction, and is composed of not less than 92½ per cent. of absolute Sulphuric Acid (H_2SO_4) and 7½ per cent. of water. It is obtained from the combustion of Sulphur and its oxidation by nitrous fumes. Its specific gravity should not be below 1.835, and it is miscible in all proportions with water and alcohol, with evolution of heat. It is occasionally used as a caustic.

Acidum Sulphuricum Dilutum, *Diluted Sulphuric Acid,*—has of the strong acid 1 part to 8¼ of distilled water, and contains 10 per cent. by weight, of absolute sulphuric acid. Dose, ♏v–xv, well diluted.

Acidum Sulphuricum Aromaticum, *Aromatic Sulphuric Acid, Elixir of Vitriol,* is Sulphuric Acid 10 per cent. by volume, 20 per cent. by weight, diluted with Alcohol and flavored with Cinnamon and Ginger. It is not an acid, but rather an ether formed by reaction between the acid and the alcohol. Dose, ♏v–xv, well diluted.

The action and uses of Sulphuric Acid generally are described with those of the other mineral acids under ACIDUM HYDROCHLORICUM. Its chief use internally is in lead-poisoning to form the insoluble sulphate, and as a remote astringent in diarrhea, hemorrhoids, hemorrhages, night-sweats and mucous discharges. In choleraic diarrhea and lead-poisoning it is generally administered in combination with Opium. The only hemorrhages in which it is efficient are those from mucous surfaces. It is excreted chiefly by the kidneys, part escaping by the bowels as sulphates, part also by the skin. Like the other mineral acids, it does not increase the acidity of the urine to any considerable extent. Its principal actions are those of an astringent, an anhydrotic and a hemostatic.

ACIDUM SULPHUROSUM, Sulphurous Acid,—is a colorless liquid of sulphurous taste and highly acid reaction, composed of not less than 6.4 per cent., by weight, of Sulphurous Acid Gas (SO_2) and 93.6 per cent. of water. It is prepared by heating Sulphuric Acid with charcoal and dissolving the evolved gas in distilled water. Dose, ♏ v–ʒj, largely diluted with water.

Sodii Sulphis, *Sodium Sulphite,* $Na_2SO_3.7H_2O$,—colorless, transparent, monoclinic prisms, efflorescent in dry air, of cooling, saline, and sulphurous taste, and neutral or feebly alkaline reaction; soluble in 4 of water and in 0.9 of boiling water, very slightly soluble in alcohol. Dose, gr. v–xxx or even up to ʒj.

Sodii Bisulphis, *Sodium Bisulphite,* $NaHSO_3$,—opaque prismatic crystals, of faint, sulphurous odor, a disagreeable taste, and acid reaction; soluble in 4 of water and in 72 of alcohol, in 2 of boiling water, and in 49 of boiling alcohol. By strong heat it is converted into sulphur and sulphate of sodium. Dose, gr. iij–xxx.

Sodii Hyposulphis, *Sodium Hyposulphite,* $Na_2S_2O_3.5H_2O$,—large, colorless, monoclinic prisms or plates, efflorescent in dry air, of cooling and bitter taste, and neutral or faintly alkaline reaction; soluble in 1.5 of water and in 0.5 of boiling water, which partly decomposes it; insoluble in alcohol. Dose, gr. v–xx.

Incompatibles.

All oxidizing substances change the sulphites into sulphates, and the Mineral Acids decompose them.

Sulphurous Acid has great affinity for oxygen, and is a powerful disinfectant and deodorizer, and very destructive to all plant life. The gas is irritant to the glottis when inhaled, and may produce dangerous inflammation of the respiratory passages.

Sulphurous Acid Gas (Sulphurous Anhydride) is extensively used as a disinfectant, being the most powerful and convenient agent for this purpose. Sulphur is burned on a shovel or plate in the room to be fumigated, all outlets having been carefully closed. The gas is injurious to many fabrics. Sulphurous Acid is used locally in many throat affections as a spray or by a mop. In diphtheria, stomatitis, aphthæ, ulcers of the tonsils, syphilitic and tuberculous laryngitis, chronic bronchitis, etc., it may be thus applied with great benefit. Morbid fermentation in the stomach, with growth of penicillium and sarcinæ, is quickly stopped by 5 to 60-minim doses in water, or by the sulphites in 20-grain doses. In parasitic skin diseases and foul wounds these agents are extremely useful as local applications.

The Sulphites and Hyposulphites are partly decomposed by the acid of the stomach, sulphurous acid being given off, and the balance being converted into sulphates act as purgatives, and are absorbed, undergoing elimination as sulphates by the kidneys and bowels. They were formerly supposed to enter the blood and tissues as sulphites, and to arrest morbid processes of the zymotic character, but both these assumptions have proven erroneous. The Sulphites were formerly used in zymotic and septic fevers as internal antiseptics on theoretical grounds, but their supposed value has not been realized.

ACIDUM TARTARICUM, Tartaric Acid, $H_2C_4H_4O_6$,—is a crystalline acid, prepared from Potassium Bitartrate by neutralizing a solution thereof with chalk and calcium chloride, then decomposing the calcium tartrate thus formed by sulphuric acid, evaporating and purifying. It occurs in colorless, transparent prisms, which are odorless, of acid taste and reaction, and soluble in 0.8 of water and in 2½ of alcohol at 59° F. Twenty grains exactly neutralize 27 of Potassium Bicarbonate, 22 of Sodium Bicarbonate, or 15½ of Ammonium Carbonate. Dose, gr. x–xxx.

Tartaric Acid is an ingredient of the Effervescing Powders (see under POTASSIUM). Four Tartrates and one Bitartrate (see Index) are official, and are described, with their actions and uses, under the titles of their respective bases. For *Potassium Bitartrate* see under POTASSIUM. The *Alkaline Cupric Tartrate Volumetric* (Fehling's) *Solution* is described in Part III under the title POISONING.

The actions and uses of Tartaric Acid are similar to those of the other Vegetable Acids, as described under ACIDUM ACETICUM. It is chiefly employed in the preparation of effervescing refrigerant drinks and effervescing granulated salts.

ACONITUM, Aconite,—is the tuber of *Aconitum Napellus*, the Monk's-hood or Wolf's-bane, a perennial plant of the nat. ord. Ranunculaceæ, found in mountainous regions of Europe, Asia and N. America. This plant has deep-blue, helmet-shaped flowers, and leaves which have deeply-cut, wedge-shaped segments, exciting slowly when chewed a sensation of tingling in the tongue and lips. The root is conical and tapering, with a thick bark enclosing a seven-rayed, star-shaped pith, odorless, taste sweetish at first, soon becoming acrid. A minute portion, cautiously chewed, causes prolonged tingling and numbness. Its active principle is the alkaloid *Aconitine* (see p. 107), which it contains in the proportion of .03 per cent. It also contains gum, sugar, *Aconitic Acid*, and several other principles, viz.—*Aconine*, *Napelline*, *Pseudaconitine*, *Lyctonine*, etc., concerning which there is much diversity of opinion. Dose, gr. ½–ij.

Other aconite-roots are those of *A. Cammarum*, *A. ferox*, and the Chinese or Japanese Aconite, *A. Chinense vel Japonicum*. From the latter an alkaloid is obtained, named *Japaconitine*, which is even more poisonous than Pseud-aconitine. The Indian variety (*A. ferox*) contains Pseud-aconitine, but does not yield Aconitine. The former is considered to be more active than the latter, and Japaconitine more so than either of the other two.

Preparations.

Extractum Aconiti, *Extract of Aconite*,—is at least four times as strong as the extract official in the U. S. P., 1870, which was prepared from the leaves, and is yet to be found in the shops. Dose, gr. ⅙–⅓.

Extractum Aconiti Fluidum, *Fluid Extract of Aconite*,—an alcoholic preparation, of which each drop represents nearly one grain of the powdered drug. Dose, ♏½–ij.

Tinctura Aconiti, *Tincture of Aconite*,—has of Aconite 35, Alcohol and Water to 100. Is about 25 times stronger than the tincture of the leaf. Dose, ♏½–iij.

Tinctures of Aconite-root vary greatly in strength. In Fleming's Tincture 79 parts of aconite are used in preparing 100 of the tincture, in that of the B. P. 16, in the French 20, the German 10, while the Linimentum Aconiti (B. P.) is really a very strong tincture, of the strength of 1 to 1½. Probably the best and safest preparation for ordinary use is a 10 per cent. tincture, of which the maximum single dose for an adult is stated in the P. Ger. at ♏ix, and the maximum daily dose at ♏xxxv.

The best rule for the administration of Aconite is to give fractional parts of a minim of the tincture (♏⅛ to ½) every 15 minutes until the desired effect is produced.

Unofficial Preparations.

Aconitina, *Aconitine*, $C_{33}H_{43}NO_{12}$,—a white, and usually amorphous solid, of alkaline reaction, soluble in 150 of cold and 50 of hot water; much more soluble in alcohol and ether. Is difficult to obtain of constant strength, some samples being all but inert, others extremely active. As obtained in the shops it is usually a mixture of several alkaloids. The *Aconitine Crystalisèe* of Duquesnel, which, according to Squibb, is a nitrate of aconitine, is considered to be the most active of those in the market. Dose, gr. $\frac{1}{200}$–$\frac{1}{50}$.

Oleatum Aconitinæ, *Oleate of Aconitine*,—is a 2 per cent. solution in Oleic Acid, for external use. Duquesnel's crystals will not dissolve in Oleic Acid (Squibb).

Napellina, *Napelline*,—is weaker than Aconitine, and has been used in doses of gr. ½–⅓. It has been studied by Laborde, who claims for it most valuable hypnotic properties, and proposes to use it as a substitute for opium and chloral.

St. Jacob's Oil (a patent medicine),—is a weak Aconite Liniment, which also contains Ether, Alcohol, Turpentine, red coloring matter and water (Squibb). It contains Turpentine (82 per cent.), Aconite, Ether, Alcohol, Carbolic Acid, Capsicum and a small quantity of Origanum (Murrell).

PHYSIOLOGICAL ACTION.

Aconite is a powerful depressant of the sensory nerve ends, the nervous and muscular apparatus of the heart and respiration and the spinal nervous system. It is also antipyretic, diaphoretic and diuretic. It acts directly on the peripheral ends of the sensory nerves, but paralyzes both the motor and sensory nerves—the sensory being affected first and from the periphery inwards, while the motor nerves are affected from the centres outwardly. It stimulates at first but soon relaxes the inhibitory apparatus of the heart, and paralyzes finally the vagus ends, the cardiac muscle and its contained ganglia, the respiratory centres, and the spinal cord in all its functions—sensory, reflex and motor; but does not affect the cerebrum.

The primary stimulation which the drug produces upon the vagus centre in the medulla slows the heart-rate at first; but its depressant action upon the motor cardiac centres and the vagus end-organs in the heart is soon manifested, and finally the vagus centre shares in the increasing paralysis, which affects the vaso-motor centre as well as the cardiac nervous apparatus. The heart-rate becomes very rapid near the end, from paralysis of the vagus terminals in its structure.

The taste of Aconite is bitter, acrid and pungent. Soon after the ingestion of even a small quantity, a sensation of numbness and persistent tingling are felt in the tongue and lips. Full medicinal doses cause a sense of constriction in the fauces, irritation of the gastro-intestinal mucous membrane with increased secretion; sometimes nausea and vomiting, and severe pains in the joints and muscles; always more or less salivation, diaphoresis and diuresis; reduced respiratory power, cardiac rate and force; lowered arterial tension and temperature.

A lethal dose produces great muscular weakness, dim sight, dilated (sometimes contracted) pupils; shallow, irregular, and labored respiration, slow and weak pulse, cold surface, clammy sweat, great anxiety, numbness and tingling in the extremities, lowered body-temperature (2° to 3°), abolished sensation, impaired reflexes and motility, and finally death from paralysis of the heart and respiration, with or without convulsions, consciousness being preserved until near the end, when CO_2 narcosis sets in. In two recorded cases, edema of the entire body resulted from eating the leaves of the growing plant.

Aconite is rapidly diffused and slowly excreted, the effects of a full medicinal dose continuing for three or four hours. Applied externally, it paralyzes the sensory nerves of the part, producing its characteristic numbness and tingling.

Antagonists.

Caffeine, *Atropine*, *Morphine*, *Ether*, *Ammonia* and *Amyl Nitrite* antagonize its effects on the heart and respiration. *Digitalis* counteracts its cardiac action and the relaxation of cardiac inhibition. In Aconite poisoning, the stomach should be evacuated, warmth applied to the extremities, stimulants administered, artificial respiration if necessary, and the recumbent posture strictly maintained. *Caffeine* may be administered hypodermically and by the mouth.

THERAPEUTICS.

Aconite was well known to the ancients, by whom it was regarded as the most virulent of all poisons. It was introduced into medicine by Aaron Störck, of Vienna, in 1762, and its pharmacology and therapeutics were the subject of an essay by Fleming in 1844, for which he was awarded a gold medal by the University of Edinburgh.

Aconite antagonizes the fever process, and rightly used is therefore one of the most valuable drugs we possess. It has well been called the "therapeutic lancet," and is certainly responsible to a great extent for the disuse of venesection. Its power over the circulation, respiration and transpiration renders it of the greatest value in all affections characterized by a high, resisting pulse, a dry, hot skin, and elevated body-temperature.

The chief indication for its use is vascular excitement in sthenic subjects; it is contra-indicated when there is adynamia, weak action of the heart, cardiac degeneration or dilatation, and gastro-intestinal irritation or inflammation. Aconite is not a remedy for use in continued fevers, and its prolonged administration is not indicated except under very exceptional circumstances. Even in the inflammatory and febrile conditions for which it is usefully employed it will be found of greatest value in their early and sthenic stages, its later use being often injurious.

Aconite is very efficient in acute affections of the bronchial mucous membrane, in coryza, tonsillitis and asthma due to exposure, also in both catarrhal and spasmodic croup. One of the best methods of "breaking up a cold" is to administer small doses of the tincture at frequent intervals for several hours, followed by 10 grains of Dover's powder at bedtime. As a febrifuge and sedative it is useful in simple and catarrhal fever, also in scarlatina, measles and erysipelas. In the early stage of acute inflammations of serous membranes, as meningitis, pleurisy and pericarditis, it has great power for good, but its employment in these affections should be restricted to the period before the stage of effusion. In acute peritonitis it is a valuable adjunct to Opium in cases presenting the sthenic characteristics which indicate its employment. In the early stage of pneumonia its sedative influence upon the respiration may be utilized with benefit, but it should not be used beyond the time when the heart begins to undergo much strain. In acute articular and muscular rheumatism it is frequently of great service, and if used from the beginning of the attack in rheumatic fever it will generally prevent the cardiac complications which are so dreaded in that disease.

Aconite has proved very efficient in neuralgia, especially if the attack is accompanied by high vascular excitement, also when the branches of the fifth nerve are affected. In cardiac affections characterized by over-action or hypertrophy and absence of dilatation or valvular lesions it gives great satisfaction, particularly in exophthalmos, nervous palpitation, and tobacco heart. Even when valvular disease is present it may be cautiously used in extreme hypertrophy to control the forcible cardiac action.

When diarrhea or dysentery follows a chill and can be ascribed to cold and exposure, the patient having high fever and cutting pains in the abdomen, Aconite will be found a very serviceable remedy. In sudden suppression of menstruation following a chill, getting the feet wet, or similar evidences of exposure, this agent is efficient in removing the discomfort and causing the reappearance of the flow. In congestive dysmenorrhea it frequently gives marked relief. In the early stage of gonorrhea drop doses of the tincture, given hourly until some physiological effect is produced, will lessen the severity of the inflammatory symptoms and prevent chordee. In the so-called urethral fever it is highly recommended, and a drop or two of the tincture given immediately after the passage of a urethral sound will prevent the chill which often succeeds that operation.

Externally, Aconite is used with benefit as a local anodyne in superficial neuralgias, herpes zoster, pruritus and chilblain. For the relief of vague, wandering pains in the limbs, liniments containing this tincture will prove more effective than those of any other form. For odontalgia the tincture may be rubbed on the gum in the vicinity of the aching tooth, or it may be introduced upon a pledget of cotton into a dental cavity. Any preparation containing this drug should be used with great caution upon an abraded cutaneous surface, as it is rapidly absorbed by the unprotected derma.

Aconite is best administered in small doses of the tincture well diluted and frequently repeated. Doses of ♏ ⅛ to ½ every 15 minutes give better results than larger ones at longer intervals.

Aconitine has proved remarkably efficient in trigeminal neuralgia. Napelline has also been praised for its influence over this affection, and as a hypnotic it is commended by several authorities.

ADEPS, Lard,—is the prepared internal fat of the abdomen of *Sus scrofa* (the Pig), purified by washing, melting and straining. It occurs as a soft, white, unctuous solid, of bland taste and neutral reaction, entirely soluble in ether, benzin, and bisulphide of carbon; composed of 38 per cent. of stearin and margarin, and 62 per cent. of olein. Lard forms 70 per cent. of Ceratum, and 80 per cent. of Unguentum, and enters into the composition of several of the official cerates.

Fats are formed of the immediate principles, *Stearin*, *Margarin* and *Olein*, which are regarded as salts composed of stearic, margaric and oleic acids with a common base, glycerin; also odorous and coloring principles.

Preparations.

Adeps Benzoinatus, *Benzoinated Lard*,—has 2 per cent. of Benzoin in powder, incorporated by stirring.

Oleum Adipis, *Lard Oil*,—is a fixed oil expressed from lard at a low temperature.

The action of the Oils and Fats is described under MORRHUÆ OLEUM (which see).

Lard is only used as an ingredient of ointments and cerates. Lard Oil is used in making the Unguentum Hydrargyri Nitratis, but has been proposed as an inferior substitute for Cod-liver oil in cases where the taste of the latter is particularly offensive.

Official Derivative and Analogues.

Acidum Stearicum, *Stearic Acid*,—is an organic acid, usually obtained from the more solid fats, chiefly tallow. In its impure, commercial form, it occurs as a hard, white, glossy solid, odorless and tasteless, permanent in the air; insoluble in water, soluble in 45 of alcohol, also in ether. It is used as a substitute for wax, and is an ingredient of the Suppositoria Glycerini. *Zinc Stearate* is described on page 528.

Adeps Lanæ Hydrosus, *Hydrous Wool-fat, Lanolin*,—is a purified fat of the wool of sheep, mixed with not more than 30 per cent. of water. A yellowish-white, ointment-like mass, having a faint, peculiar odor; insoluble in water, but miscible with twice its weight thereof.

Under the name *Lanolin* this substance was in use for several years before it became official. It is a cholesterin fat, and a very old medicament, having been mentioned by Ovid, Herodotus, Pliny and Aristophanes; yet the process of obtaining it from the suds from the washings of sheep's wool is patented in this country by Liebrich. It differs from all other fatty substances chiefly in resisting saponification and the action of water, having no tendency to become rancid; and readily passes through the integument, carrying with it any medicament with which it is charged. It is a perfectly neutral base, and therefore is not liable to decompose any ordinary substance. The difficulty about its use has been its very disagreeably sheepy smell, but recent samples seem in great measure to be devoid of this objectionable quality. It is particularly useful in chronic skin diseases where there is infiltration, and where a penetrative action is desired for medicaments locally applied. In a few cases of acute and subacute eczema it has proved irritating, but as a rule it is perfectly bland. Where a simple protective action is alone desired it is inferior to Lard, Vaselin or Cold Cream.

Cetaceum, *Spermaceti*,—is a peculiar, concrete, fatty substance obtained from the sperm whale. It occurs in white, pearly masses, which are odorless, of bland taste and neutral reaction, becoming rancid in the air, soluble in ether, chloroform, carbon disulphide and boiling alcohol. It is a constituent of—

Ceratum Cetacei, Spermaceti Cerate,—contains Spermaceti 10 parts, White Wax 35, Olive Oil 55.

Unguentum Cetacei, Spermaceti Ointment (B. P.),—contains Spermaceti 5, White Wax 2, Almond Oil 18, Benzoin ½. The last-named ingredient renders the ointment irritating and therefore unsuitable for use on the eye, for hemorrhoids, etc.

Unguentum Aquæ Rosæ, Ointment of Rose Water, Cold Cream,—contains Spermaceti, Almond Oil, Rose Water, etc. [See under ROSA.]

Spermaceti consists of *Cetin* (Cetyl Palmitate) with several other fats in small quantities. Its action is solely that of an emollient, and it is rarely used internally, though an alcoholic preparation was once a regular prescription for coughs, bronchial irritation, and for a recently delivered woman. The Cerate is employed as a bland ointment for blisters, abrasions and ulcers, but it is too stiff for easy application, and the unofficial Ointment is preferred in practice. The latter on lint to broken blisters from walking affords great relief, and may be smeared on the feet to prevent injury from a rough tramp over broken ground.

Sevum, *Suet*,—is the internal fat of the abdomen of *Ovis Aries* (the Sheep), purified by melting and straining. It should be kept in well-closed vessels and not used after it has become rancid, as it will on exposure to air. It is a white, smooth, solid fat, of bland taste and neutral reaction, insoluble in water or cold alcohol, soluble in 44 of boiling alcohol, 60 of ether, and slowly in 2 of benzin. It consists chiefly of Stearin, but also has Palmitin and Olein, and is a constituent of Unguentum Hydrargyri. It is a harder fat than lard and more liable to turn rancid. It is used in ointments and liniments to give them greater consistency, but may be applied alone as a dressing to ulcers. In physiological action and therapeutics it follows the other oils and fats. [See under MORRHUÆ OLEUM and OLIVÆ OLEUM.]

ADONIS (Unofficial),—is the plant *Adonis vernalis*, the Pheasant's Eye or False Hellebore, a perennial herb of the nat. ord. Ranunculaceæ, which grows wild in Europe and Asia. It contains *Aconitic Acid*, also the toxic glucoside *Adonidin*, which is the active principle and is found in small quantity in all parts of the plant.

Preparations.

Tinctura Adonis, *Tincture of Adonis*,—Dose, ʒ ss–ij.

Infusum Adonis, *Infusion of Adonis*,—has from 4 to 8 parts of the plant in 200 of water. Dose, ℥ ss every 4 to 6 hours.

Adonidinum, *Adonidin*,—a canary-yellow, hygroscopic powder, of intensely bitter taste and neutral reaction, soluble in water and in alcohol. Dose, gr. $\frac{1}{16}$ to $\frac{1}{3}$, repeated 3 or 4 times a day.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Adonis, when fresh, has acrid, irritant and vesicant properties, which disappear when the plant is dried. It affects the heart in the same manner as Digitalis, but more promptly, slowing, regulating and strengthening the beats and thereby raising the blood-pressure in the arteries. In consequence of the latter action it is a diuretic and removes edema and dropsy. It also slows and deepens the respiration, and relieves dyspnea. In toxic dose it paralyzes the terminals of the vagus, excites the accelerator apparatus of the heart, and finally causes paralysis of the cardiac motor nerves. It is rapidly eliminated and does not accumulate in the system. *Adonidin* has similar action, which is almost exactly like that of digitalin, but stronger, and about ten times as powerful as that of digitoxin (Brunton). In large doses it causes either vomiting or diarrhea (Huchard).

In Russia this plant is a household remedy for cardiac and renal dropsy, and in Siberia it is used as an abortifacient. It is useful in cases of uncompensated heart disease, in which, by reason of arrhythmia and feeble cardiac energy, grave circulatory disorders exist, especially dyspnea and dropsy. It is recommended in functional irregularity of the heart and in palpitation without any cardiac lesion (Da Costa). It acts more promptly than digitalis and may be administered for months without cumulative effect, hence it is preferred to digitalis in those cases of mitral or aortic regurgitation in which the latter drug is not well tolerated. In general it is less certainly beneficial in valvular disease than digitalis, and should only be used when the latter fails (Nothnagel). In connection with the bromides this drug has been successfully used in epilepsy.

ÆTHER, Ether, *Ethyl Oxide* $(C_2H_5)_2O$,—in its absolute form is not official, the strongest preparation containing 4 per cent. of alcohol and some water. Considered as a generic term an ether is analogous to a salt as an alcohol is to a metallic hydrate. The particular ether officially so named is *Ethyl Oxide*, prepared from Ethyl Hydrate (Ethylic

Alcohol) by a dehydrating agent with the aid of heat, and then purified by various processes. The agent used is Sulphuric Acid, hence this ether is improperly called "Sulphuric Ether," but the acid simply dehydrates the alcohol and remains in the retort, becoming constantly more diluted by the abstraction of water from the alcohol. Consequently H_2O is the difference between Alcohol and Ether. $(C_2H_6O)_2 - H_2O = (C_2H_5)_2O$. The official ethers are the two first named in the following list.

Æther, *Ether,*—is a volatile and inflammable liquid, composed of about 96 per cent. of absolute Ether (Ethyl Oxide), and about 4 per cent. of Alcohol containing a little water. Sp. gr. 0.725 to 0.728 at 59° F. It is the preparation employed for anesthetic use, and is generally though improperly called "Sulphuric Ether," a term which belongs to Ethyl Sulphate ($C_4H_{10}SO_4$). The dose of Ether for internal administration is ♏x–ʒj, in syrup; hypodermically for heart failure, ♏xv–xx. It is best prescribed as Spirit of Ether, which mixes readily with water.

Water dissolves a tenth of its volume of Ether, and reciprocally Ether takes up about the same proportion of water. It is colorless, of a strong and characteristic odor, hot and pungent in taste. It evaporates speedily in the open air, with the production of considerable cold. When good, it evaporates from the hand, without leaving a disagreeable odor. It boils at about the temperature of the body (98.6° F.), and its vapor is very heavy and very inflammable. It dissolves Hydrargyrum Bichloride, Hydrargyrum Iodidum Rubrum, Iodine and Bromine freely; Sulphur and Phosphorus sparingly. It is also a solvent of the fixed and volatile oils, many resins and balsams, caoutchouc, and most of the organic vegetable alkaloids. It does not dissolve Potash or Soda, in which respect it differs from Alcohol.

Æther Aceticus, *Acetic Ether, Ethyl Acetate,* $C_2H_5C_2H_3O$,—is an inflammable liquid, transparent and colorless, of ethereal and acetous odor, soluble in alcohol, ether, chloroform, and in 8 of water. It is a constituent of Spiritus Odoratus and Tr. Ferri Acetatis. Dose, ♏x–ʒj.

Hydrobromic Ether, *Ethyl Bromide,* C_2H_5Br (Unofficial),—is not inflammable. Dose internally and hypodermically, ♏x–ʒj.

Hydriodic Ether, *Ethyl Iodide,* C_2H_5I (Unofficial),—is a colorless liquid, non-inflammable, and insoluble in water. Dose, inhaled, ♏xv.

For the Chlorinated Ethers see under CHLOROFORM.

Preparations.

Oleum Æthereum, *Ethereal Oil,*—is a volatile liquid, consisting of equal volumes of heavy Oil of Wine and Ether. Used to prepare the Spt. Ætheris Comp. As it occurs in commerce is usually a worthless preparation.

Spiritus Ætheris, *Spirit of Ether,*—has of Ether one-third, Alcohol two-thirds. Dose, ♏x–ʒj.

Spiritus Ætheris Compositus, *Hoffmann's Anodyne,*—contains Ether 32½ per cent., Alcohol 65, Ethereal Oil 2½. Dose, ♏v–ʒj.

Spiritus Ætheris Nitrosi, *Spirit of Nitrous Ether, Sweet Spirit of Nitre,*—is an alcoholic solution of Ethyl Nitrite, $C_2H_5NO_2$, containing 5 per cent. of the crude ether. It turns acid with age, and should not be kept long. It is a constituent of Mist. Glycyrrhizæ Co. (3 per cent.). Dose, ʒss–℥ss. Its incompatibles are Potassium Iodide, Ferric Sulphate, Tinct. Guaiaci, Tannic and Gallic Acids, and Antipyrin.

Anesthetic Mixtures.

Nussbaum's has—Ether 3 parts, Chloroform 1, Alcohol 1.

Vienna General Hospital uses—Ether 9, Chloroform 30, Alcohol 9.

The "Vienna Mixture,"—Ether 3, Chloroform 1.

Medico-Chirurgical Society of London (1864) approved a mixture originally introduced by Dr. Geo. Harley, and known as the "A. C. E. Mixture." It consists of Alcohol 1, Chloroform 2 and Ether 3 parts.

Schleich's Solutions—are three in number, and are made up by volume and not by weight, as follows: (No. 1), Ether 6, Chloroform 1½, Benzin (Petroleum Ether) ½. (No. 2), Ether 5, Chloroform 1½, Benzin ½. (No. 3), Ether 2⅔, Chloroform 1, Benzin ½; or Ether 80 cc., Chloroform 30 cc., Benzin 15 cc. The latter is adapted to major operations and has a boiling point of 107.4°.

PHYSIOLOGICAL ACTION OF ETHER.

Ether is anodyne, antispasmodic, diaphoretic and anthelmintic; a cardiac and cerebral stimulant, an anesthetic, and a narcotic poison. Given internally, it is a most powerful stimulant of secretion, acting especially on the secretions of the stomach, salivary glands and pancreas. On the cerebrum and the motor and sensory nerves its action is similar to that of alcohol, but more prompt and less protracted. It is eliminated rapidly, chiefly by the lungs. Externally it is a powerful refrigerant and local anesthetic; also rubefacient when rubbed into the skin.

Ether when inhaled produces at first faucial irritation, a sense of strangulation and cough; then a stage of excitement (cerebral intoxication), in which the face is flushed and the respiration and pulse are accelerated. A tetanic convulsive stage generally follows, the face being cyanosed, the muscles rigid, and the respiration stertorous. This soon subsides, and complete insensibility is established, the muscles being then relaxed, the reflexes abolished, and the cerebral functions suspended, the lower centres in the medulla carrying on the processes of respiration and circulation. If the inhalation be continued, these also become paralyzed, death usually resulting from slow paralysis of respiration, the heart pulsating long after breathing has ceased. If the inhalation be discontinued before the lower centres are affected, the patient gradually emerges from the condition of insensibility, and, as the narcosis subsides, vomiting is usually experienced.

Dr. Brunton found that in a hot climate Ether will decompose within a few hours, and hence, during his investigations for the Hyderabad Chloroform Committee, he found it impossible to obtain pure ether. This may account for the preference for Chloroform as an anesthetic which is so universal in the Southern States.

Ether is less irritant than Chloroform to the mucous membranes when swallowed, but its vapor is more irritant to the air-passages. The one grave danger following its administration is the subsequent development of a broncho-pneumonia, rarely a lobar pneumonia. Acute mania has followed its inhalation for anesthesia, but only in a few cases. Ether is a cardiac and vaso-motor stimulant and raises the blood-pressure; Chloroform is a cardiac and vaso-motor depressant and lowers the blood-pressure. Ether has been often administered with safety in cases of organic heart disease. It does not clot the blood. Its vapor is very inflammable, less pleasant to inhale than that of Chloroform, is slower in action, has a longer stage of excitement, and a less profound narcosis, and causes a greater degree of vomiting. It is much less dangerous than Chloroform, death from the inhalation of Ether occurring slowly and usually by paralysis of respiration—from Chloroform, it is almost always sudden, and is generally believed to occur by paralysis of the heart. Ether has undoubtedly been the direct cause of a number of deaths, besides several which occurred some hours after the termination of its anesthesia; but the sudden deaths produced by it have nearly all occurred in patients who had some lung disease or some enervating lesion, as intestinal obstruction, tumor of the brain, cancer or kidney disease. When bronchitis or renal disease exists Ether is positively dangerous. The mortality of ether-anesthesia is about 1 in 16,500 cases.

Modes of Dying in Anesthesia.

(1.) From sudden paralysis of the cardiac ganglia, early in the inhalation, by reflex action proceeding from some peripheral injury before complete anesthesia is produced. Thus, in the extraction of teeth, a small quantity of Chloroform having been administered, the heart is enfeebled, and the action of the cerebral hemispheres suspended, but not that of the basal or medullary ganglia. If at this stage the 5th nerve be irritated, by the intimate relation of its nucleus with that of the pneumogastric reflex inhibition may be transmitted over the latter, arresting the cardiac ganglia. The stage of incomplete anesthesia is always a dangerous one in which to perform any operation around the distribution of the 5th nerve.

(2.) In the stage of rigidity, from tetanic fixation of the respiratory muscles, the blood backing up on the venous side, and arresting the heart's action, respiration ceasing before the cardiac action is stopped.

(3.) In the stage of complete relaxation, by paralysis of respiration; or by paralysis of the tongue, causing obstructed respiration.

(4.) In the same stage, by paralysis of the motor ganglia of the heart.

(5.) From depression of the functions by chloroform narcosis, and from shock,—and may occur in the anesthetic state, or afterwards.

Contraindications for Anesthesia are: fatty degeneration or dilatation of the heart, renal and pulmonary disease, fainting fits, enlarged tonsils, cerebral tumor, diabetes mellitus and chronic alcoholism—particularly the first and last named.

Dangerous Symptoms should be met by withdrawing the vapor and inverting the patient head downwards, drawing the tongue forwards, and applying a cold douche to the face and chest. *Atropine* hypodermically is an agent of great value in combating the cardiac failure,—artificial respiration and faradization of the respiratory muscles if breathing ceases. *Strychnine,* hypodermically, as a cardiac and respiratory stimulant, has many advocates, and has done good service, especially in chloroform narcosis. *Amyl Nitrite* by inhalation, or *Ammonia,* hypodermically. Heat to the body and limbs.

Comparative Safety of Anesthetics.

A comparison of these agents in respect to their safety has been made by Dr. Richardson, who considers *Methylic Ether* to be the safest of all, and the others as follows:

Safe are—Ethyl Bromide, Ethyl Chloride, Ether, Ethene (olefiant gas), Ethene Chloride, Methyl Bromide, Methyl Chloride, Methyl Ether, Methene Chloride, Methane (marsh gas), Nitrous Oxide.

Of doubtful value are—Amylene, Amyl Chloride, Butyl Chloride, Benzene (benzol), Carbon Disulphide, Carbon Dioxide, Carbon Tetrachloride, Methyl Alcohol, Methylal, Spirit of Turpentine.

Dangerous are—Amyl Hydride, Butyl Hydride, Carbon Monoxide, Ethyl Hydride. Chloroform and Ethene Dichloride are considered useful, but requiring care.

PHYSIOLOGICAL ACTION OF OTHER ETHERS.

Hydriodic Ether is an antispasmodic and a general stimulant; also an anesthetic if inhaled for a sufficiently long time. Its use as a medicinal agent is chiefly to bring the system rapidly under the influence of Iodine. It increases appetite, stimulates the action of the heart, gives vivacity to the general feelings and activity to the intellect.

Hydrobromic Ether has a not unpleasant odor, produces but little irritation of the air-passages, has very brief stages of excitement and rigidity, and but a short stage of insensibility, with prompt awakening and but little of the mental confusion and excitement consequent on the use of the other anesthetics. It is not inflammable, acts quickly, and is a good local anesthetic. Its action in other respects corresponds with that of Ether.

Nitrous Ether is a mild diaphoretic, a diffusible stimulant, a carminative, and an efficient diuretic. On the blood it acts similarly to Amyl Nitrite, diminishing oxygenation, relaxing the peripheral vessels, accelerating the heart's action, and thus lowering arterial tension. Relaxing the renal and cutaneous vessels, it is diuretic and diaphoretic.

Acetic Ether has a pleasant odor and taste, forming agreeable combinations with other carminatives as a stimulant and antispasmodic.

THERAPEUTICS.

When diluted with alcohol Ether mixes readily with water, and may be administered internally with advantage in indigestion of fats, and to aid the digestion of cod-liver oil. It is also given in hysteria to relieve the paroxysm and flatulence, and in hepatic colic from calculi, Ether with Turpentine (Durande's solvent remedy), which acts only as an anodyne and antispasmodic, is considered by some as of great value. Subcutaneously Ether is used in the algid stage of cholera, sudden cardiac depression, neuralgia, and in the adynamia of hemorrhage, pneumonia and the eruptive fevers. Local anesthesia by the Ether-spray affords great relief in neuralgia of superficial nerves, lumbago, chorea, and spinal irritation. In minor surgical operations it is a valuable method.

As a General Anesthetic the vapor of Ether is less prompt than that of

Chloroform, but is equally efficient and much safer. It should be inhaled in as concentrated a form as possible, and will then produce insensibility in from 5 to 10 minutes. If a light be in the room it should be high above the patient. A grate-fire or gas-stove in the vicinity is very dangerous. [Compare the article on CHLOROFORM.] Besides its surgical uses ether-anesthesia is employed in neuralgia, cancer, tetanus, chorea, colic, delirium, puerperal mania and convulsions, infantile convulsions, hystero-epilepsy, epileptic seizures, laryngismus stridulus, whooping-cough and asthma. The unpleasant after-effects may be greatly modified if not entirely prevented by the previous administration of Morphine (gr. $\frac{1}{8}$–$\frac{1}{4}$) and Atropine (gr. $\frac{1}{120}$) subcutaneously.

Schleich's Method is based upon the theory that the safest general anesthetic is one which has a maximum evaporation point slightly above the body-temperature of the patient, so that its elimination by the lungs during each act of expiration may be nearly, but not quite, as much as its absorption during the previous act of inspiration. Such an anesthetic is obtained by mixing Ether, Chloroform and Benzin in various proportions, the result giving true chemical solutions [only mixtures according to some chemists], the evaporation points of which may be varied at the will of the anesthetist and adapted to the patient's body-temperature at the time of administration. By this method the dangers belonging to either agent when given alone are avoided. Ether, having a low evaporation point, 93° F., must expand in the pulmonary alveoli, distending them, obstructing respiration, causing cyanosis, and promoting bronchial secretion and liability to subsequent pneumonia. Chloroform, having a high evaporation point, 149° F., must be eliminated by the lungs more slowly than it is absorbed, and accumulating in the blood it endangers the heart and strains the organs of elimination to remove it subsequently. The maximum evaporation point of the A. C. E. mixture is about 119° F., a good deal nearer the body-temperature than the evaporation point of chloroform, and hence it is safer than the latter anesthetic alone. Schleich's three solutions (see *ante*, page 114) have been used by many anesthetists with great satisfaction. Dr. Meyer of New York has reported on 100 cases, in which there were scarcely any unpleasant symptoms, no ill results whatever, and in only 4 per cent. was there albuminuria subsequently, and that was slight and transient. Stone of Omaha reports on 250 cases without a death, the operations being of all degrees, the anesthesia quickly produced and practically no unpleasant results following; but he attributes much of his success to his use of his own mask and the Overholt dropper. Dr. Rodman of New York has reported on 700 cases, with very unfavorable conclusions. (*Jour. Amer. Med. Ass.*, Nov. 4, 1899.)

Hewitt's Method, which is preferred in England, is to administer nitrous oxide gas first and follow with ether in a closed inhaler. This method is rapid and safe, the preliminary choking sensation of ether is avoided, and unconsciousness is quickly produced.

Hydrobromic Ether had a short period of popularity as an anesthetic, but fell into disrepute after a few cases of death under its influence, which were probably not due to the agent used (Levis' and Sims' cases). Its action is less prolonged than that of Ether, but it has many advantages, requiring only ʒj to ℥ij, rapidly given, and being noninflammable. Its inhalation has been of especial value in hysteria, epilepsy, chorea and other spasmodic disorders; and it has been employed subcutaneously in place of Ether in the treatment of such spasmodic affections as whooping-cough, chorea, etc.

The Compound Spirit of Ether (Hoffmann's Anodyne) is an admirable agent in gastralgia, colic, flatulence, syncope, etc., also in the various manifestations of the hysterical paroxysm. In combination with the camphorated tincture of Opium it is often remarkably efficient in checking the diarrhea of hot weather.

Spirit of Nitrous Ether is used as a diaphoretic, a diuretic and a carminative; also in expectorant mixtures, as an antipyretic in febrile affections, and to relieve pain in angina pectoris, dysmenorrhea and asthma. When its diuretic effect is desired it should be administered in iced water, and the patient should be lightly covered: but when its diaphoretic action is required, it should be preceded by a hot drink, and the patient should be well covered.

Hydriodic Ether may be obtained in glass capsules containing five minims each, and is used by inhalation in chronic pulmonary disorders, cardiac dyspnea, spasmodic affections of the bronchi and larynx, asthma, and catarrhal laryngitis. It is not employed as an anesthetic.

Pental, *Tri-methyl-ethylene*, C_5H_{10} (Unofficial),—is a colorless liquid, highly inflammable, insoluble in water, but miscible in all proportions with alcohol, ether and chloroform. Sp. gr. 0.678. It is obtained by heating amylene hydrate in the presence of acids.

Pental is an efficient anesthetic, equal to Nitrous Oxide in its rapidity of action and safety, but superior thereto in its more prolonged action and its having no unpleasant after-effects. Under it there is seldom any stage of exhilaration, and consciousness is sufficiently retained to enable response to commands, even when insensibility to pain is reached. It does not lose its effect by repeated inhalations. Compared with Chloroform, it acts more promptly, and has no evil after-effects; with Ethyl Bromide, it is somewhat slower in action but more lasting in effect, and can be prolonged as may be necessary; with Nitrous Oxide, it can be continued for a longer time, is more safe, and free from after-effects of unpleasant character.

AGARICUS ALBUS, White or Purging Agaric (Unofficial),—is the fungus *Polyporus officinalis*, which grows on the European larch. It occurs in large, white, spongy pieces; and contains *Agaricic* or *Laricic Acid*, also from 40 to 70 per cent. of resins. The term *Agaricin* was formerly applied to the impure Agaricic Acid containing about 3 per cent. of *Agaricol*, which is physiologically inert.

The taste of Purging Agaric is first sweetish, then becoming very acrid and bitter. The powder inhaled causes violent sneezing, and taken internally in full doses it produces watery stools. Small doses check diarrhea and dysentery, and diminish the secretions of the bronchi and mammæ.

Agaricus Albus was formerly employed as a drastic purgative, in doses of gr. xxx to ʒj. It has lately been used, with much success, in 15-grain doses of the powder, or 3 grains of the alcoholic extract, to check the night-sweats of phthisis. Agaricic Acid has proved very valuable in checking persistent sweating from any cause, especially that occurring after influenza. The dose is gr. $\frac{1}{12}$ to $\frac{1}{3}$: and it should not be given hypodermically.

AGARICUS CHIRURGORUM, Surgeon's Agaric (Unofficial),—is the interior portion of the fungus *Polyporus fomentarius*, which grows on the trunks of beeches, birches, and oaks in Europe. It is prepared for use by boiling in weak lye and beating with mallets, and then occurs in light, thin, yellowish-brown pieces, soft and pliable, without odor or taste. It is almost pure cellulose. It was formerly used as a mechanical hemostatic, and for the purpose of moxa. When soaked in a strong solution of the Nitrate or Chlorate of Potassium and dried, it is very inflammable, and is called *Spunk*.

AGARICUS MUSCARIUS, Amanita Muscaria, ***Fly-Agaric*** (Unofficial),—is a poisonous mushroom, of disagreeable odor and burning acrid taste, used in infusion with milk for poisoning flies, and by the

Tartars as an intoxicant. It contains an actively toxic alkaloid, *Muscarine*, $C_5H_{13}NO_2$, of syrupy consistence, odorless and tasteless, soluble in water and alcohol, and readily dissolved out by water and dilute acetic acid, so that a doubtful mushroom may be easily rendered innocuous. Muscarine is produced synthetically by the oxidation of choline, but it is doubtful whether the article so prepared is as active as the natural alkaloid.

Muscarinæ Nitras, *Muscarine Nitrate* (Unofficial),—a viscid, yellowish-brown liquid. Dose, gr. $\frac{1}{30}$–$\frac{1}{16}$ (Merck); gr. $\frac{1}{3}$–$\frac{3}{4}$ (Ringer). It may be used hypodermically.

PHYSIOLOGICAL ACTION.

Agaricus acts as an intoxicant to the cerebrum, producing more vertigo and delirium than Alcohol, followed by profound sopor with lowered reflexes, perhaps coma and death. The action of Muscarine is very like that of Pilocarpine and almost completely opposed to that of Atropine. It is a powerful respiratory and cardiac depressant, paralyzing the respiratory centre and arresting the heart in diastole by paralyzing its motor ganglia while stimulating its inhibitory apparatus. It lowers the arterial tension, produces profound salivation, lachrymation and sweating, contracts the pulmonary vessels, causing intense dyspnea, and increases the intestinal, hepatic and pancreatic secretions, but markedly diminishes the renal. It disturbs the gastro-intestinal tract, causing tetanic intestinal contractions, severe colic, vomiting and purging. It produces spasm of the accommodation, marked myosis and contraction of the pupil when given internally, but dilates the pupil widely when locally applied. [Gelsemium does so also.] Under its action the body-temperature is decidedly reduced, and the excretion of waste-products is lessened. It is eliminated unchanged by the kidneys.

Antagonists.

Atropine exactly opposes Muscarine, and *vice versâ;* no example of physiological antagonism being so complete in all particulars. When a frog's heart is arrested by the topical action of a minute quantity of Muscarine, the application of a little Atropine will immediately paralyze the inhibition and restore the pulsations. An equally prompt antagonism runs through their entire spheres of action. *Digitalin* is to some extent antagonistic; so also is *Physostigmine*.

THERAPEUTICS.

Muscarine has been as yet little used in medicine, but it will probably prove to be a valuable drug. It has been long used, with marked benefit, for the night-sweats of phthisis, given in doses of 5 minims of a one per cent. solution, hypodermically. It promises to be of great value in inflammation characterized by copious exudation, especially eye-inflammations, catarrhal jaundice, recent hemorrhoids, acute bronchitis, pulmonary hemorrhage, incipient pulmonary congestion, diabetes of both forms, and in constipation due to intestinal torpor and deficient secretion, accompanied by a torpid liver and difficult digestion of fats. In the latter affection it should be given in small doses, gr. $\frac{1}{80}$, thrice daily. A tincture of Agaricus has been found beneficial in ataxic typhus, chorea and chilblain.

AILANTHUS, Tree of Heaven (Unofficial),—is the bark of *Ailanthus glandulosa*, a well-known shade tree, of the nat. ord. Simarubaceæ, indigenous to China, but cultivated elsewhere. It contains an oleo-resin and a volatile oil, on which its properties probably depend. Dose, gr. x–ʒj.

Extractum Ailanthus Fluidum, *Fluid Extract of Ailanthus*,—Dose, ♏x–ʒj.

Tinctura Ailanthus, *Tincture of Ailanthus*,—Dose, ♏x–ʒij.

Ailanthus is a decided nauseant, and a drastic purgative, causing also vertigo, weakness. cold sweats, dull headache, pains in the back, numbness and tingling in the limbs. It paralyzes the cerebrum and spinal cord of animals, impairment of motility beginning in their hind extremities. The cardiac action, at first increased, soon slows, the pulse becoming small and weak, and the respiration depressed, death occurring from paralysis of respiration. It is a good teniafuge.

Ailanthus is used against tapeworm, a decoction of the fresh bark (ʒj to ℥iv), or the oleo-resin in drachm doses, being very efficient. It has also been well employed in malignant scarlatina, with dark and partial eruption, insensibility, delirium and other cerebral symptoms.

ALBUMIN AND ALBUMINOIDS.—Albumin (Albumen) is the typical member of a group of organic proximate principles which have the same general chemical composition but very different physical properties, and are called albuminoids, proteids, or nitrogenous principles. They all contain N, together with C, O, H, and Sulphur. The chief members of the group are *Albumin*, *Fibrin* and *Casein*, often termed the histogenetic bodies, because they are essential to the building up of the animal organism. Each of the three is resolved by caustic potassa and heat into *Protein*, which may then be thrown down by acetic acid. The albuminoids are originally formed in the vegetable kingdom, occurring in all parts of plants but especially in their seeds. [See *ante*, page 28.] When eaten by animals they undergo digestion into soluble compounds (peptones), which pass into the blood and are retransformed into serum-albumin before being built into the tissues. *Albumin* is the most important member of the group, as it forms the principal portion of all animal tissues, varying from 1 part per 1000 in the cerebro-spinal fluid to 383 per 1000 in the crystalline lens. The composition of its molecule is very complex and varies widely within certain limits in different organs and conditions, but $C_{72}O_{22}H_{112}N_{18}S$ is given as its approximate formula.

Albumin is amorphous, soluble in water, coagulated by heat, and occurs in three native forms, viz.—(1) *Serum-albumin*, which is yellow, elastic, transparent, soluble in water but precipitated by alcohol and by strong acids, and coagulated by heat at 104° F. (2) *Egg-albumin*, differs from the first by precipitating when shaken with ether, and in other respects. It is soluble in water and coagulated by heat. (3) *Plant-albumin*, occurs in nearly all vegetable juices and especially in the seeds of plants. It is coagulated by heat and strongly resembles egg-albumin.

Official Albuminous Substances.

Albumen Ovi, *Egg-albumen*,—the liquid white of the egg of the domestic hen, *Gallus Bankiva*, var. *domestica*, is official in the B. P., and contains, in 100 parts, *Albumin* 12, with 3 of mucus and salts, dissolved in 85 of water.

Many writers use the spelling album*en* for the name of the proximate principle albumin. Others distinguish between the white of egg (album*en*) and its chief constituent (album*in*).

Vitellus, *Yolk of Egg*,—is the yolk (or yelk) of the hen's egg, and occurs as a viscid, reddish-yellow, opaque liquid, of bland taste and alkaline reaction, coagulated by heat and by alcohol. It may be regarded as a dense emulsion of oil suspended in water by means of albumin. It contains, in 100 parts, Vitellin 16 to 18, Cholesterin 0.4, Lecithin 7, Fat 21 to 31, also salts, etc., and from 48 to 55 of water. *Vitellin* is described as a mixture of albumin and casein (Fowne), or as a proteid related to casein mixed with about one-fourth of albumin (Nat. Disp.).

Glyceritum Vitelli, *Glycerite of Yolk of Egg*, *Glyconin*,—consists of Vitellus 45, Glycerin 55, rubbed together until thoroughly mixed.

Gelatin,—is a derivative of the proteids *ossein* and *collagen*, and is obtained from bones, tendons, cartilage, skin, and other fibrous animal structures by prolonged boiling in water. It swells up in cold water, is soluble in boiling water, and its aqueous solution solidifies (gelatinizes) on cooling. Its composition is similar to that of albumin but it does not yield protein. Gelatin is the basis of soup, beef-tea, and other preparations made from meat with boiling water. It is official in the form—

Ichthyocolla, *Isinglass*,—the swimming-bladder of several species of sturgeon, occurs in horny, semi-transparent sheets, iridescent, soluble in 24 of boiling water, and forms on cooling a transparent jelly. It is the purest form of Gelatin known.

Emplastrum Ichthyocollæ, *Isinglass Plaster*, *Court Plaster*,—consists of Isinglass 10, Glycerin 1, Alcohol 40, Water and Tincture of Benzoin, spread on taffeta and allowed to dry.

Chondrus, *Irish Moss*, *Carragheen*,—is a Sea-weed consisting of two algæ, *Chondrus crispus* and *Gigartina mammilosa*, dried and bleached. It contains mucilage 55½, water 19, mineral matter 14, albuminoids 9½, and cellulose 2 per cent. A jelly may be prepared by boiling 2 oz. in a quart of water for an hour, then straining and adding 3 oz. of sugar while hot. The dose is indefinite.

Irish moss is horny, translucent, pale yellowish-white, of sea-weed odor and mucilaginous saline taste. It swells in cold water but does not dissolve. On boiling with 30 parts of water for 10 minutes it yields a solution which gelatinizes on cooling. It is a demulcent and nutrient of some slight value in bronchial and catarrhal affections; but as it contains no starch it is not as valuable as Iceland Moss (Cetraria) as a food for the sick. [See under the title AMYLUM.] Another member of the Algæ is the *Fucus Vesiculosus*, which is described under its own title.

Unofficial Analogues of Albumin.

Fibrin,—is the proteid which causes the clotting of plasma, lymph, and the blood when shed. It does not exist in the living, circulating blood, but is formed by the mutual action of fibrinogen, fibrino-plastin and fibrin-ferment, which arise as products of the breaking up of white blood-corpuscles. In normal blood it occurs to the extent of 0.2 per cent., is increased in inflammation and diminished in hemophiles.

Fibrin has the same general composition as albumin but contains more O and S. Its special characteristic is its power of spontaneous coagulation. It is insoluble in water and in ether, and is changed into syntonin (acid-albumin) by dilute hydrochloric acid.

Casein is the proteid contained in milk. Its composition is the same as that of albumin, but it differs therefrom in not being coagulated by heat and by being thrown down by organic acids which do not precipitate albumin. It is, by some authorities, supposed to be a combination of albumin and potash.

Gluten, is a nitrogenous constituent of the seeds of wheat and other cereals, the former containing it in the proportion of from 8 to 15 per cent. It is made up of a number of albuminous principles which differ but slightly from each other, the chief ones being gluten-fibrin, gluten-casein, gliadin and mucedin.

Unofficial Albuminous Preparations.

Beef, among meats, has the highest nutritive value. The average of many analyses shows its composition to be as follows: In 100 parts, total albuminoids 20¾, fat 2¾, extractives 1½, salts 1½, water 73½, also a minute quantity of creatin.

Extracts of Meat prepared by boiling down the flesh of animals, as Liebig's Extract, are stimulants, not nutrients, as they contain practically none of the nutritious (albuminous) constituents of meat but only the salts and flavoring matter (E. Smith).

Meat-juices, prepared by a cold process of extraction and partial digestion, are claimed to retain the fibrin, gelatin and coagulable albumin. Many such are on the market, under the trade-names Bovinine, Bovril, etc.

Chittenden, by analyses of various meat extracts, has shown that they possess very little nutritive value as compared with fresh lean beef. In most of them the fat is less than 1 per cent., and the total amount of available proteid is far below 1 per cent. Some are even less nutritious than ordinary beef-tea.

Beef Peptonoids is the trade-name of a powdered preparation which is claimed to consist of the nutritive constituents of beef with milk and wheat gluten, partially peptonized and containing 95 per cent. of nutritious material. *Liquid Peptonoids* is intended to represent the same combination in liquid form, all the constituents being entirely digested and ready for assimilation. *Panopepton* is a similar preparation.

Sanose is a food preparation which is claimed to contain 100 per cent. of albuminous material, of which 80 is casein and 20 is albumose.

Somatose is a dry powder, which is said to contain nearly 90 per cent. of albumoses, 80 grains corresponding in nutrient value to about 1½ ounces of fresh beef.

Milk contains all the elements necessary for the growth and nutrition of animal tissues in the most digestible form. Its chief albuminoid constituent is *Casein*, but it also contains fat, sugar, salts and water, which vary in proportion according to the animal and its food. *Cow's Milk*, of sp. gr. 1,030, averages, in 100 parts, of albuminoids 4, fat 4, sugar 5, salts ½, and water 86½. *Goat's Milk* is very near to that of the cow in composition, but *Asses' Milk* has much less of casein and salts, very little fat, and more sugar and water. *Woman's Milk* contains about the same proportion of casein as asses' milk, more fat than cow's milk, more sugar than the others, and less salts than any except asses' milk.

Buttermilk contains, in 100 parts, casein 4½, sugar 2½, fat ¼, salts ½, lactic acid ¼, and water 92.

Condensed Milk is prepared by adding refined sugar and an alkali to fresh cow's milk, then evaporating the mixture in vacuum pans until it has a thick, semifluid consistency. *Desiccated Milk* occurs in the form of a dry powder, and is highly esteemed by the armies of Europe.

Peptonized Milk is prepared by adding to fresh cow's milk one-third part of water, in which, after boiling and cooling, there is dissolved a pinch of Sodium Bicarbonate, and ʒj or ʒij of Liquor Pancreaticus is added to each pint. The mixture is then allowed to stand in a warm place for an hour, when it is ready for use. *Peptogenic Milk Powder*, containing the requisite proportions of the alkali and the pancreatic ferment, may be obtained in the drugstores and will prove satisfactory.

Cheese is obtained from the milk of animals, especially the cow, by coagulating the casein by means of rennet or an acid, and after separation submitting it to pressure. It contains, in 100 parts, albuminoids (casein, etc.) 28 to 45, fat 6 to 30, salts 4 to 5, and water 36 to 44; the proportions of each varying according to the quality of the milk used.

Kumyss, *Koomiss*,—is an effervescing fermented liquor originally prepared by the Tartars from mare's milk, but now imitated with cow's milk by adding sugar of milk, fermenting in open tanks, skimming off the casein and butter, then bottling during active fermentation. Its successful preparation depends on its undergoing slow fermentation in a cold room, at 50° F. or less. If the temperature be higher, the fermentation will be of the acetous variety, and will result in sour milk with heavy curd, feeble effervescence and repulsive taste.

Wolff's Formula, for its preparation in small quantity, is as follows:—Dissolve ℥ss (a tablespoonful) of grape sugar in ℥iv of water. Dissolve gr. xx (a teaspoonful) of Fleischmann's compressed yeast or well washed and pressed out brewer's yeast in ℥ij of cow's milk. Mix the two solutions in a quart champagne bottle, and fill it within two inches of the top with good cow's milk. Cork well, secure the cork with wire, keep it in a cellar or ice chest, maintaining a temperature of 50° F. or less, and agitate twice daily. In three or four days it is ready for use, but should not be kept longer than four or five days. Draw it with a champagne tap.

Kumysgen is a powder containing the elements necessary for the preparation of Kumyss, for which a special bottle and tap are also furnished by the manufacturers. It is a very convenient manner of making this preparation, and the product tastes just as well as that made in the ordinary way. Whether it acts as well therapeutically remains to be ascertained.

Kéfir is the name of a fermented drink prepared from the milk of a cow or mare by the addition of a mushroom-like ferment found near the snow-line in the Caucasian Mountains. It is used by the natives of the Asiatic plains as a remedy for struma, anemia, lung and stomach diseases. Kéfir is richer in albuminoids than Kumyss, is less alcoholic and less acid.

The following table shows the average composition of Milk, Kumyss and Kéfir :—

	Cow's milk.	Kumyss.	Kéfir.
Albuminoids (casein, etc.),	4	1	4
Butter,	4	2	2
Sugar of milk,	5	2½	2
Lactic Acid,	—	1	1
Alcohol,	—	1½	1
Water and salts,	87	92	90

PHYSIOLOGICAL ACTION.

The normal adult human organism, doing ordinary work, loses daily by its metabolism 4½ oz. of albuminous or proteid matter, besides 14½ oz. of carbo-hydrates, 3 oz. of fat, 1 oz. of salts and 2½ quarts of water, these quantities being largely increased during the performance of laborious work. A corresponding amount of these substances must be daily ingested in order to supply material for the repair of the tissues and for the production of heat and other forms of force. The albuminoids are most important alimentary principles, their chief office being the repair of the tissues, and they being the only foods containing nitrogen, an essential element in the formation of every structure which manifests any form of energy. They can replace each other in supplying nutrition to the tissues, their composition is identical with that of the same substances in the blood and other tissues, and they consist wholly of nutritive material in concentrated and digestible form. They undergo digestion in the stomach by the acid gastric juice, also in the intestine by the pancreatic juice, the respective ferments of which convert them into soluble *peptones*, the form in which they enter the blood. The digestive changes through which they pass are—(1) *proteid*, the albuminoid, as ingested; (2) *acid-albumin* or *syntonin* in the stomach, *alkali-albumin* in the intestine; (3) *propeptone* or hemialbumose; and (4) *peptone*. The chief products arising from their oxidation within the body are CO_2, H_2O and Urea, the latter containing nearly all their nitrogen. They are mainly obtained by the ingestion of animal food, as flesh, milk, eggs, etc., but they are also contained in vegetable products, especially the seeds of certain plants, and those of leguminous plants (peas, beans, lentils, etc.) contain more proteid material than any kind of meat.

The increased ingestion of albuminoid food, by persons who have previously used it sparingly, improves the quality of the blood by increasing the number of the red corpuscles, and causes a rise in the sp. gr. of the urine and a greater excretion of urea and uric acid. Individuals who consume albuminoids in excess of their requirements are lean but muscular, irritable in temper and prone to excessive sexual appetite. The exclusive use of animal food develops a superabundance of muscular force, so that a nation of meat eaters is usually one of hunters possessing a warlike and savage disposition.

Disease may be produced by food of any kind through excess or deficiency in quantity, special characteristics of quality, or imperfect digestibility. Albuminoid food in excess produces congestion and enlargement of the liver and probably of other organs. If exercise is not taken at the same time, the albuminoids are imperfectly oxidized, and deleterious products are retained in the system, or the eliminating organs are irritated by the passage through them of material which they are not adapted to remove. A great excess of albuminoids, without other food, produces in a few days marked febrile symptoms, malaise and diarrhea; and if persevered in albumin appears in the urine. Gout probably arises in the same way, partly from the use of alcohol, which delays metamorphosis, partly from using too much albuminoid food, and partly from want of exercise. A diet which is deficient in albuminoids causes a lessening of bodily activity and the gradual oncome of an adynamic condition which predisposes the subject to infectious diseases and modifies the course of many affections, typhoid fever running its course in such cases with less elevation of temperature than is usual and with less excretion of urea. Complete deprivation of albuminoids produces loss of muscular strength, mental debility and feverish and dyspeptic symptoms, followed by anemia and prostration.

The advantages of a meat diet are:—its large amount of nitrogenous material, the presence in it of iron and important salts, and also much fat, the latter performing to great extent the office of the carbo-hydrates in supplying fuel to the body. It is easily cooked, is very digestible whether raw or cooked, and is more readily assimilated than any vegetable food. Its great disadvantage is that it contains neither starch nor sugar, hence it cannot supply all the carbon needed by the body unless so large a quantity of it be taken (4½ lbs. of beef daily) as would soon impair the digestive organs.

Beef contains alimentary principles which are most important for the nutrition of the body. When of good quality, neither too old nor too young, having the fat and muscle suitably proportioned and unaltered by disease, and properly cooked, it is the best of the animal foods.

Milk is an excellent albuminous food, but its proteid, casein, is coagulated by the acids in the stomach, even by the acid of the gastric juice, and is tolerated with difficulty by many persons, especially in the large quantity which must be taken to itself maintain the nutrition of the organism. As an exclusive diet, for anyone above the infant age, it soon palls upon the appetite, and causes a sense of emptiness at the epigastrium, a coated tongue and an unpleasant taste in the mouth. The subject of an exclusive milk diet is usually constipated, the stools being hard and of ochre-yellow color, but if diarrhea is produced it shows that the milk is not digested. The urine is greatly increased in quantity and the body-weight is gradually diminished to a certain point, where it remains. The pulse is quickened at first and arterial tension is lowered, but the pulse-rate falls as soon as the body ceases to lose weight. A sense of weakness is usually experienced, but many persons are greatly debilitated and some complain of vertigo.

Kumyss has an acidulous and peculiar taste. In large quantity it can take the place of other food for a time, each quart equalling 4 oz. of solids. It is a powerful diuretic, especially in cold weather, and in warm weather it causes free perspiration. It is stimulant and tonic, increases the nutrition of the body and produces considerable somnolence. The stomach tolerates it well, even when it rejects all other food. It is easily assimilated and very nutritious.

Eggs, like milk, constitute an almost complete food, as they contain all the elements required by the blood. According to Pavy an egg weighing 2 oz. has 110 grains of albuminous material, 82 grains of fat and 11 grains of saline matter. The white, consisting chiefly of albumin dissolved in water, contains the larger proportion of nitrogenous material, and the yolk contains the greater quantity of fat.

Gelatin is undoubtedly a food, as it increases vital action in the same direction, if not in the same degree, as albumin (E. Smith). Like albumin, however, it must not be relied on alone, but should be mixed with a proper quantity of other foods. It is an efficient styptic.

THERAPEUTICS.

The chief affections in which nitrogenous food is required are diabetes mellitus, anemia, obesity, phthisis and other wasting diseases, and long-continued fevers. In fever there is an excessive consumption of the proteids of the body and the eliminative processes are very active, the discharge of urea being often enormous. All this increases the demand of the organism for albuminoid food, but the digestive power of the stomach is, at the same time, greatly reduced, the secretion of gastric juice being diminished. In carcinoma of the stomach and some other affections hydrochloric acid is absent from the gastric juice, and in many diseases gastric digestion is feeble or imperfectly performed. Hence it becomes important to furnish albuminoid foods in such form that they may be assimilated with the least possible expenditure of digestive energy. Peptones can be prepared outside the body and administered as food, but when artificially made they have little nutritive value, are unable to supply the need of the organism and are exceedingly disagreeable tion in normal saline solution being injected every other day slowly into the thigh or abdominal wall. Isinglass has no advantage over any other form of gelatin. It is used for clarifying liquids and in solution as a test for tannic acid. The plaster, commonly called *court-plaster*, is a useful protective agent for cuts, sores, etc.

Milk is the only food which is proper for infants up to the age of eight months, their digestive organs being unable to manage the farinaceous aliments. For those who are deprived of their natural milk the best substitute is cow's milk diluted with about one-third part of water and sweetened with sugar, which should be given at a temperature of 100° F. and at intervals of about three hours. The addition of lime-water instead of ordinary water will make it more digestible. As an exclusive diet for older children and adults, milk is employed with great benefit in many gastric and intestinal disorders; also in albuminuria, diabetes, ascites, anasarca, eczema, gout, aneurism, and in irregular and tumultuous cardiac action due to valvular disease of the heart. Skimmed milk is better borne than unskimmed milk in many affections of the gastro-intestinal tract. Milk is the one food available in typhoid fever and may be wholly depended on as aliment in that disease. It is especially useful in scarlet fever, both as a nutrient and a diuretic. In intestinal indigestion, cholera morbus, cholera infantum, and the ileo-colitis of children, it is necessary to supply only such foods as are digested in the stomach, in order to give the intestine rest, hence milk, eggs, meat-juices and meat-broths are the suitable articles of diet in these affections.

Buttermilk contains lactic acid, which does not exist in ordinary milk, and in consequence it is more easily digested than the latter. It is particularly useful in gastric disorders, albuminuria and diabetes.

Kumyss is an invaluable article of diet in many wasting diseases, especially phthisis. It is of great benefit in dyspepsia, the diarrheas of children, convalescence from acute maladies, chronic affections of the kidneys, and other cachexiæ. In cases of feeble digestive power an ounce every hour is sufficient, but as its digestion and assimilation increase it may be given almost *ad libitum*, and when used with other food a half-pint may be taken after each meal. Each quart is estimated to contain four ounces of solid food, besides from 1 to 3 per cent. of alcohol.

ALCOHOL, Alcohol, *Ethyl Alcohol, Ethyl Hydrate,* C_2H_5OH. The official alcohol is *Ethyl Alcohol,* which is represented in the pharmacopœia by the several preparations named Brandy, Whiskey, and Wine, as also under the following four forms, viz.—

Alcohol Absolutum, *Absolute Alcohol,* C_2H_5OH,—is *Ethyl Alcohol,* containing not more than 1 per cent. by weight of water. A transparent, *Formic Aldehyde*, Formaldehyde, CH_2O,—is a gaseous body prepared by subjecting methyl alcohol to oxidation. It is readily absorbed by water, and is put on the market in the form of a 40 per cent. aqueous solution named *Formalin*, which is a powerful antiseptic, disinfectant and deodorant, and is described under its own title.

Paraldehyde, $C_6H_{12}O_3$,—is a polymeric form of Aldehyde and a valuable hypnotic. It is described under its own title.

A Ketone bears the same relation to an aldehyde that an Ether does to an alcohol, being an aldehyde in which the hydrogen has been replaced by a radical. The most important Ketone is—

Hypnone, Phenyl-methyl-acetone, $C_6H_5(CO)\ (CH_3)$,—a hypnotic agent of moderate energy, described under the title CHLORAL.

Principal Unofficial Alcohols.

Methyl Alcohol, *Methyl Hydrate, Wood-spirit*, CH_3OH,—also called Carbinol, Methol, Hydroxymethane, is a non-fermented alcohol, obtained from the destructive distillation of wood. Ordinarily it contains many impurities, which give it a very disagreeable odor, and mixed with ethyl alcohol it renders the latter so disagreeable as to be unfit for drinking. Such a mixture is sold, under the name *Methylated Spirit*, for use as a solvent in the arts, as a combustible in lamps, etc.

Amyl Alcohol, *Amyl Hydrate, Potato-spirit, Fusel Oil*, $C_5H_{11}OH$,—is a fermented alcohol obtained from the potato, also occurring in the crude spirit produced by the fermentation of saccharine solutions with yeast, and separated by the excessive distillation thereof, passing over after the ethyl alcohol. It is oxidized into Valerianic Acid. From it is prepared *Amyl Nitrite*, by distilling with nitric and sulphuric acids and copper wire. It is an oily liquid, of penetrating and oppressive odor and burning taste: sparingly soluble in water, but soluble in all proportions in alcohol, ether and essential oils.

Official Alcoholic Preparations.

Spiritus Frumenti, *Whiskey*,—obtained from the distillation of the mash of fermented grain; rye, wheat or corn (U. S.), barley (Scotch), and at least two years old. Sp. gr. 0.917 to 0.930. Has an alcoholic strength of 44 to 50 per cent. by weight; also Ethers developed by the action of acetic and butyric acids on the alcohol, and traces of Amyl Alcohol (fusel-oil) even in the best. Dose, ʒij–℥ij.

Spiritus Vini Gallici, *Brandy*,—obtained from the distillation of the fermented juice of grapes, and at least four years old. Sp. gr. 0.925 to 0.941. Has an alcoholic strength of 39 to 47 per cent. by weight, and Œnanthic and other Ethers developed by age. Pale Brandy is colored by the cask, the dark has caramel to color it. Is often prepared artificially by adding to high wines Acetic or Nitric Ether, Caramel, and Logwood or Catechu for astringency. Dose, ʒij–℥ij.

Spiritus Rectificatus, *Rectified Spirit*,—official in the B. P., is Alcohol with 16 per cent. of water, obtained by the distillation of fermented saccharine fluids. Sp. gr. 0.838. Is often spoken of as "56 over proof," meaning that to reduce 100 volumes of it to the strength of proof spirit requires 56 volumes of water.

Spiritus Tenuior, *Proof Spirit*,—official in the B. P., is prepared by mixing Rectified Spirit 5 volumes with 3 of Distilled Water; has a sp. gr. of 0.920, and contains of absolute alcohol about 49 per cent. by weight, about 57 per cent. by volume.

Vinum Album, *White Wine*,—should contain from 10 to 14 per cent. by weight of absolute alcohol, and is made by fermenting the unmodified juice of the grape, freed from seeds, stems and skins. California Riesling, Ohio Catawba, etc. Dose, ℥j–℥iv.

Vinum Rubrum, *Red Wine*,—should contain from 10 to 14 per cent. by weight of absolute alcohol, and is made by fermenting the juice of colored grapes in presence of their skins. Native Claret, Burgundy, etc. Dose, ℥j–℥iv.

Unofficial Alcoholic Preparations.

Rum,—is obtained from the distillation of fermented molasses, and has about 42 per cent. by weight of alcohol.

Gin, has about the same alcoholic strength as rum, and approaches very nearly to the official Spiritus Juniperi Compositus. It is usually distilled from rye or barley, and flavored, in Holland, with juniper berries and hops, in England, often with oil of turpentine, various cheap aromatics, acetate of lead, sulphate of zinc, cayenne pepper, etc. Pure gin is slightly diuretic, from the oil of juniper contained in it.

Spiritus Odoratus, *Perfumed Spirit*, *Cologne-water*,—prepared by adding to 800 parts of Alcohol, Water 158, Acetic Ether 2, Oil of Bergamot 16, Oil of Lemon 8, Oil of Rosemary 8, Oil of Lavender Flowers 4, and Oil of Orange Flowers 4 parts. A perfume and ingredient of lotions.

Vinum Aromaticum, *Aromatic Wine*,—consists of Stronger White Wine 94 per cent., with Lavender, Origanum, Peppermint, Rosemary, Sage and Wormwood, of each 1 per cent. It was official in the U. S. P. 1880.

Vinum Portense, *Port Wine*,—is not a natural wine, spirit being added during the process of manufacture, and the alcoholic strength raised to 30 or 40 per cent.

Vinum Xericum, *Sherry Wine*,—a dry, spirituous white wine, generally made to order by the dealers, and having from 20 to 35 per cent. of alcohol.

Sparkling Wines, as Champagne, Hock, Catawba,—are more or less sweet, and charged with carbonic acid, being bottled before fermentation is completed and the grape sugar all converted into alcohol. They contain 8 to 10 per cent. of absolute alcohol.

Sweet Wines, as Burgundy, Tokay, Muscatel, Malaga, Angelica, Madeira, etc.,—are of low alcoholic strength, 6 to 7 per cent. unless fortified.

Light Red Wines, as Claret, Red Rhine, Concord,—have 5 to 7 per cent. alcohol, tannic acid, grape coloring matter, etc.

Dry Acid Wines, as Rhine and Moselle, California Hock, Kelley Island Catawba,—in these fermentation is complete, and the alcoholic strength from 5 to 7 per cent.

Beer, Ale and Porter,—are fermented liquors, made from malted grain, with hops and other bitters added. Beer is made by slow fermentation, the yeast sinking; Ale by rapid fermentation, the yeast floating. Their alcoholic strength is from 2 to 3 per cent. in beer, to 4 to 6 per cent. in ale and porter,—and they also contain malt extract, carbonic acid, lactic acid, various aromatics, potassium and sodium salts, etc.

Kumyss,—is obtained by the fermentation of milk, that of the mare being used in Tartary, where it is employed as a food. It contains from 1 to 3 per cent. of alcohol, sugar, lactic acid, casein, fat, salts, carbonic acid and ethers. [See page 123.]

Physiological Action of Alcohols.

The Alcohols of the series to which the above-mentioned belong are all narcotic poisons when taken in sufficiently large doses; and have the general effect of paralyzing the nerve-centres in the inverse order of their development. The symptoms produced may be divided into stages, viz.—(1) Stimulant, (2) Narcotic and Anodyne, (3) Anesthetic, (4) Paralytic; therein closely following the action of the volatile anesthetics derived from them, though wanting in the profound degree of anesthesia which the latter produce. Ethyl Alcohol, the effects of which are detailed below, has the most typical action, and in poisoning by it at all these stages follow each other in regular order. In poisoning by Methyl Alcohol the excitement is greater, the subsequent stages succeed each other more rapidly, and if the dose be insufficient to cause death, the effects pass off more quickly. They all lower the body-temperature.

The post-mortem appearances, after acute poisoning by the alcohols, show changes in the blood, stomach, intestines, liver, lungs and kidneys; some of which are probably due to the asphyxiation resulting from the paralysis of respiration. The Blood is dark and clotted in the heart. The Stomach and Intestines are congested and softened, especially so if the ingested alcohol has been undiluted. The Liver is very much congested, soft and friable. The Spleen is gorged with blood and softened. The Lungs are congested and show small extravasations of blood, and in the Kidneys also hemorrhages are found.

PHYSIOLOGICAL ACTION OF ETHYL ALCOHOL.

Externally applied, Alcohol is a powerful antiseptic and disinfectant, also refrigerant, astringent, anhidrotic, rubefacient, and slightly anesthetic. Applied to the exposed skin it quickly evaporates, cooling the surface, temporarily contracting the superficial vessels, and checking the secretion of the sweat-glands. If its evaporation is prevented, as by covering with a watch-glass or a piece of rubber, or if the alcohol is rubbed in, it absorbs water from the tissue and hardens it. It also coagulates the albumin of the part, but the coagulum is soon redissolved by the fluids of the tissues. It then dilates the vessels of the derma, producing a sensation of warmth and a rubefacient effect upon the skin. Upon the mucous membrane of the mouth and pharynx similar effects are produced by the same application. If the alcohol is concentrated, a burning sensation is felt immediately; also an increased flow of saliva and quickened pulse, due to reflex action. Then follows a slight local anesthesia of the part, and if the alcohol be held there for some time, the mucous membrane becomes whitish and opaque, from coagulation of the albumin, abstraction of water from the tissue and congestion of its vessels. This soon disappears, as resolution of the albumin occurs.

Internally, in moderate quantity and single dose, Alcohol acts briefly as a cerebral, cardiac and general stimulant; in large doses as an anesthetic, an intoxicant and deliriant, and finally as a narcotic poison and paralyzant of the nerve-centres. It is somewhat antipyretic, also diuretic and antispasmodic, and is hypnotic in many cases.

A single dose of a strong alcoholic preparation, for example an ounce of neat brandy, introduced into the stomach, immediately produces important and valuable reflex effects. The cardiac rate is quickened, and its force is increased; the vessels of the entire body are dilated, especially those of the skin; the blood-pressure is raised, and a sense of glowing heat is produced. These reflex effects are well seen in the prompt restoration of a fainting person by the administration of a single dram of whiskey or brandy. By the same means the nausea, paleness and other unpleasant symptoms produced by tobacco are promptly counteracted.

Internally, in small quantity diluted, Alcohol dilates the gastric vessels, reddens the mucous membrane of the stomach, produces a sense of warmth and comfort, stimulates the gastric glands to increased production of gastric juice, and increases the activity of the gastric movements. Taken moderately, immediately before or during meals, it promotes the appetite and assists digestion; lessens the elimination of waste-products (urea and CO_2), causes a subjective sensation of heat, and slightly raises the body-temperature. It briefly stimulates the heart, prolonging its systole and reducing the length of the diastole, and increases the functional activity of all the organs. The effects of large doses are very injurious; the vaso-motor nerves are partially paralyzed for a time, causing dilatation of the arterioles throughout the body; the pepsin of the gastric juice is precipitated, the gastric and hepatic vessels are congested, the walls of the stomach are rendered hyperemic, and the gastric glands and hepatic cells are over-stimulated to the production of pathological secretions. If the ingestion is continued, even in moderate quantities frequently repeated, chronic gastritis ensues, gastric mucus is poured out in large amount, the gastric glands soon atrophy, and the permanent dyspepsia of drunkards is set up, with morning vomiting of glairy mucus. The further effects of large doses are the total arrest of digestion, the production of intoxication, perhaps hallucinations and delirium, also great incoördination of thought and motion, depressed sensibility, depression of the heart and respiration, lowered arterial tension and body-temperature, abolished reflexes, stupor, and, if the dose be sufficient, coma and death.

Upon the *Blood* Alcohol acts to first increase and then diminish the ameboid movements of the white corpuscles, and so affects the red corpuscles as to prevent the oxyhemoglobin from readily parting with its oxygen. It consequently diminishes the oxidation of the tissues, and may lead to imperfect combustion of fat, which then accumulates. The result is obesity in many persons who habitually consume large quantities of alcoholic beverages, especially if these contain much saccharine material.

Upon the *Heart and Circulation* the first effects of Alcohol are those of slight and brief stimulation by reflex action. After its absorption the same effects are exhibited in a more marked degree. The pulse becomes fuller, the action of the heart is quickened and its force increased, due mainly to direct stimulation of its accelerator nerves. The vaso-motor system is inhibited, causing dilatation of all the vessels of the body, especially those of the periphery, and producing a sense of increased body-heat. The blood-pressure is raised, the great increase of cardiac action overcoming the results of the vascular dilatation. The mental and bodily functions are all stimulated for a time, the person feels better for the dram, his muscular power seems to be increased, more urine is passed, and perspiration is freer. But these effects are very transitory, and after a brief period of stimulation reaction sets in, and the entire organism is depressed to a lower point than where it was before the ingestion of the alcoholic stimulant. Large doses do not stimulate the heart at all, but immediately depress it, both by reflex action and by direct paralysis after their absorption. A toxic dose may paralyze the heart almost immediately by direct depressant action, but usually, after a very brief period of excitement, insensibility is produced, also stertorous breathing, dilated or contracted pupils, complete muscular resolution, and death by paralysis of the heart and respiration. The action of alcohol upon the heart clearly exemplifies two therapeutic laws: (1) That excessive stimulation is necessarily followed by depression, and (2) that drugs which in moderate doses excite a function are very apt in large doses to paralyze it.

The extremists, who find no good whatever in alcohol, hold that it is a fallacy to apply the term "stimulant" thereto,—that alcohol is a paralyzant from first to last,—that its apparent cardiac stimulation is in reality the result of its narcotism of cardiac inhibition,—and that every special sense is blunted by even small doses of this poison. They calmly ignore the fact that their premises apply to every stimulant in its special field of action as well as to alcohol in its sphere, and forget that their conclusion (that alcohol has no place in medicine except as a poison) applies by the same reasoning to every other stimulant. Hence, to be consistent, they should advocate the banishment of all stimulant drugs from the materia medica.

On the *Skin and Kidneys* Alcohol is mildly diaphoretic and diuretic, acting partly by its vascular dilatation, partly by stimulation of glandular activity. On the *Intestines* it has a slightly astringent effect at first, but in those who use it habitually to excess the bowels are always very loose, and the evacuations watery.

Upon the *Nervous System* Alcohol has specific and selective action. By a moderate dose this entire system is briefly stimulated, chiefly as a result of increased blood supply due to the vascular dilatation and cardiac elevation. Reaction, however, soon occurs, and if the dose be very large, the period of exaltation quickly passes into one of profound cerebral depression, but this is usually preceded by marked incoördination of thought and of muscular movement, shown by incoherency of language, difficult speech, and staggering gait. The reflex activity of the spinal centres is abolished next, the urine and feces are discharged involuntarily; the depression extends to the respiratory centre, breathing becomes difficult and the face cyanosed; profound coma supervenes, respiration and the heart are paralyzed, and the patient dies.

The reflex depression occurs early in the case, and accounts for the impunity with which a drunken man will often bear an injury which would cause death by shock to a sober one.

The action of Alcohol upon the nervous system illustrates well, in the order of its events, the physiological fact that excessive stimulation is followed by depression; as well as the law that drugs which affect the functions progressively exhibit their earliest powers upon those functions which are highest in development (being those latest acquired by the individual and last to appear in the species), and influence next the next lower, until finally the lowest, namely those of respiration and circulation. The primary stimulation and subsequent depression of function proceeds therefore, in a descending scale from the highest or least firmly fixed and latest acquired function, to the lowest or most firmly fixed one. Thus, by Alcohol, the intellect is affected very early and the judgment abolished very soon, even though the imagination, the emotions and the powers of speech remain stimulated. Soon these follow the same course, imagination is abolished, the patient loses command over his emotions, cries and laughs immoderately and without reason; next loses control over his organs of speech, talking incoherently and thickly, and then can only make a noise. At the same time other delicate and lately developed movements, as those required for writing, feeding, etc., are incoördinately performed and soon paralyzed. General muscular movements, being less highly and earlier developed, are next to become implicated, being first incoördinated, and soon abolished. The paralysis of reflex action follows, though lowered earlier in the case, then paralysis of respiration and finally paralysis of the heart.

The antipyretic action of Alcohol is partly due to its power of lessening oxidation, but chiefly to the dilatation which even moderate doses produce in the vessels of the surface. This dilatation subjects the warm blood from the interior of the body to the cooling influence of the atmosphere, also to the cooling due to evaporation from the skin; and if kept up by repeated drams in a freezing temperature will soon so chill down the blood as to kill the subject.

Under ordinary conditions the contraction of the cutaneous vessels, in a person exposed to cold, prevents the warm blood from approaching the surface in any great quantity and becoming cooled; but this mechanism is temporarily paralyzed by every dose of alcohol, admitting the hot blood to circulate freely over the surface, and to be rapidly cooled down until the patient may be absolutely frozen to death as a result of repeatedly taking "something to keep him warm." This fact is well known to Arctic travelers and to the lumbermen of the northern forests, who have been taught by bitter experience to let alcohol alone when exposed to severe cold.

Delirium Tremens occurs after an alcoholic debauch, usually in cases where the stomach is so deranged as to prevent the ingestion or assimilation of food. So long as the toper can eat and digest his food he is practically not liable to this affection. It generally begins in from two to four days after the patient has lost his appetite and commenced to reject or vomit his food; and is marked by great restlessness, obstinate insomnia, a peculiar tremor of the tongue and limbs; also delusions connected with the sense of sight, the patient imagining that he sees *animals* around him (dogs, rats, snakes, beetles, etc.). The delirium is constant and active, may become violent and pass into mania, or the patient may die suddenly while in this state, without any warning symptoms. In several cases observed by the writer the delirium appeared four and five days after the last alcoholic dose was taken, though the patient was eating, sleeping, and working during the interval, apparently convalescent. Under treatment, and especially if sleep is brought on, the delirium usually subsides gradually, and the patient recovers.

Chronic Alcoholism is the result of the ingestion for a considerable length of time of an excessive quantity of alcohol, even though perhaps never sufficient to cause acute intoxication. One of the earliest symptoms usually observed is the vomiting of watery fluid or glairy mucus in the morning after rising. The bowels are generally loose, and the evacuations watery. The skin has a greasy look and a satiny feel, and the cutaneous capillaries on the face may become permanently dilated, giving to the cheeks a characteristic, dusky-red hue, and a flaming red color to the nose. In old drunkards, the latter organ often becomes covered on its tip with dusky-red tubercular enlargements, making it a very unsightly appendage. The stomach and liver are in a state of chronic congestion, the food is not digested and often to a great extent abandoned, the patient, in fact, living upon alcohol. Eructations of gas and flatulence are constant and distressing; the body is usually puffed and bloated, the eyes bleary, red and watery. [One of the most graphic descriptions of the drunkard's personal appearance is that by Trollope, in "Orley Farm," Chapter 57.]

After a time the connective tissue of the liver increases (hyperplasia), its parenchymatous structure atrophies or undergoes fatty degeneration, the organ contracts (sclerosis), the portal circulation is impaired, the veins of the abdominal integument become prominent, and soon ascites ushers in the final stage. Sclerosis of the kidneys may accompany that of the liver. The general impairment of function extends early to the nervous system, the mental powers are dulled, the temple becomes irritable, and tremor appears in the tongue, lips and hands. As a result of the prolonged use of alcohol very serious pathological changes take place throughout the organism. It exerts its essential and most injurious influence on the vital organs by its presence in the circulation, being thus brought into direct contact with the cellular tissues of the vital organs. It sets up hyperplasia of the connective tissue, resulting in sclerosis, especially in the stomach, brain, liver and kidneys; produces fatty degeneration (steatosis) of the blood, the arterial walls and the parenchyma of the various organs, depresses the brain, the heart and the arterial tension. Chronic disease of the heart, the arteries and the mucous lining of the stomach and intestines, gout, diabetes, Bright's disease of the kidneys, paralysis, ataxia, peripheral neuritis, epilepsy, amaurosis, and insanity may result from the continued use and abuse of alcohol. The malt liquors (beer, ale, etc.) are less prone than spirits to affect the brain, but are even more apt to set up fatty degeneration of the heart and liver. The heart is very liable to undergo gradual hypertrophy, partly by reason of the constant whipping up it receives from every dram of alcohol taken, and partly as a result of renal sclerosis. Several of the largest hearts ever seen by the writer at autopsies, some of which were veritable instances of *cor bovinum*, occurred in subjects of chronic alcoholism associated with employment involving exposure and great anxiety, as in masters of steamships, superintendents of mines, etc.

Impurities in Alcohol increase greatly its toxic action; so that inferior brandy from a public liquor shop has a lethal action nearly one-half greater than that of pure ethyl alcohol. (Dujardin-Beaumetz.)

Alcoholic Coma may be easily confounded with that of apoplexy, opium narcosis, concussion of the brain, acute pneumonia, uremia and epilepsy, the differential diagnosis being almost impossible to make with accuracy when the coma is deep. The pupils afford no trustworthy indication, as they may be either dilated or contracted in alcoholism. They are often unequally contracted in apoplexy, and in apoplexy of the pons varolii they may be equally and minutely contracted, as in opium-poisoning. The difficulty of diagnosis is increased by the common practice of giving a dram of whiskey as a reviver, so that a stranger found insensible on the street and brought to a hospital may smell of alcohol without having been the subject of alcoholism. When no accurate history of the case can be obtained the diagnosis is impossible in many cases.

Alcohol is rapidly diffused throughout the organism, which oxidizes a portion of it, about an ounce and a half for the adult in 24 hours, the oxidation yielding force, which is utilized as nervous, muscular, and glandular power. A large quantity is decidedly poisonous, as it sets up structural changes in the various organs, and lowers the power of resistance to morbific influences. It renders its victims particularly liable to phthisis, and has frequently caused directly an intractable form of that disease, pulmonary sclerosis. It makes patients bad subjects for withstanding any severe illness, especially pneumonia, or to successfully undergo severe surgical operations.

The portion not oxidized is excreted unchanged by the lungs, the skin and the kidneys, but does not appear in any quantity in the urine unless very large amounts have been ingested. The very young and the very old bear more alcohol relatively than the adult. It has been proven to exist normally in the human organism, and within the limit above stated it is undoubtedly a food, as is shown by the fact of its retention and combustion in the body, supplying the place of other foods, so that the quantity of food which without it would be insufficient, with its aid becomes sufficient to maintain the body-weight.

Treatment of Acute Alcoholic Poisoning.

If a very large dose has been taken recently, the stomach should be evacuated of what is unabsorbed. Then *Ammonia* may be given by inhalation cautiously, warmth applied to the extremities, cold affusion to the head, faradism of the muscles of respiration. Milk, mucilaginous drinks, black coffee, are useful afterwards. *Lupulin* as a substitute stimulant, or *Capsicum* in 20 to 30 grain doses. *Chloral*, in doses of 30 grains, repeated in two hours, to secure sleep, is very efficient, or 30 grains each of Chloral and *Potassium Bromide*, for the same purpose. Chloral is said by teachers to be dangerous in old alcoholic cases, but the daily experience of physicians of inebriate asylums does not corroborate this statement. Nutritious, digestible diet in liquid form and small quantity frequently repeated, is an essential feature of the treatment. *Ammonium Chloride*, ʒss in ½ pint of water at one draught, and the *Liquor Ammonii Acetatis*, in doses of ℥j. are said to have marvellous power in straightening up a drunken subject, restoring the faculties and antagouizing stupor.

Treatment of Delirium Tremens.

Two principal objects are aimed at,—to support the strength by nutritive diet, and to overcome the obstinate and exhausting insomnia and restlessness. For the latter purpose the mixture of *Chloral* and *Potassium Bromide* above mentioned is by far the most efficient agent, and the dose (gr. xxx of each) may be repeated every two hours until sleep is secured. *Digitalis* has been administered in large doses to quiet the delirium, and successfully in some cases, but this is a very dangerous treatment. (Brunton.) *Opium* or *Morphine* may be used in cases which show signs of exhaustion, but should be confined to such alone. Its general employment in this affection is decidedly injurious. *Bismuth*, with Magnesia and Hydrocyanic Acid, for the vomiting. *Nutrient Enemata* may be required, if the patient is unable to retain food. *Alcohol* should not be given.

Treatment of Chronic Alcoholism.

The continued ingestion of alcohol in excessive quantities is not a disease, as sentimentalists would have us believe, but is simply a vicious drug-habit, and may be overcome, like any other drug-habit, by the exercise of the subject's will-power alone in abstaining therefrom. The effort to gradually reduce the amount consumed simply prolongs the agony and is much less efficient than the total and immediate withdrawal thereof entirely. This should be carried out in an inebriate asylum in most cases. *Strychnine* is a specific remedy for alcoholism, and the basis of all the so-called "cures" which are extensively advertised under the gold-extracting title of "Gold Cure." Ten to twelve minims of a solution of Strychnine Nitrate, gr. iij in ℥x of distilled water, should be injected hypodermically 3 or 4 times a day for two weeks, and less often for two weeks more, gradually reducing the dose and frequency of administration.

THERAPEUTICS OF ALCOHOL.

The external and local use of alcohol in medicine includes many applications of its antiseptic, astringent, refrigerant and rubefacient qualities. Diluted, in the proportion of four parts to one of water, it makes an excellent lotion for bruises, sprains, and other slight injuries, where it is desired to cool the part and check impending inflammation. A perfumed spirit, as Cologne Water, is commonly used as a lotion to the forehead for the relief of headaches. Alcohol does good service as an application to prevent bed-sores and cracked nipples, as it hardens the inflamed skin by abstracting water therefrom and coagulating the albumin temporarily. Diluted alcohol is applied on the surface of the body in fevers, to cool the skin and check excessive sweating. Alcoholic liniments (Linimentum Camphoræ, etc.) are rubbed into the cutaneous tissue for their rubefacient effect, to aid the absorption of inflammatory products and to relieve pain, in chronic rheumatism, lumbago, myalgia, etc. As a gargle or spray, diluted alcohol is one of the very best local agents in tonsillitis, pharyngitis, and other inflammatory affections of the throat, especially diphtheria, in which disease it fulfils several important purposes, acting as an efficient local antiseptic, astringent and anesthetic. Among miners, hunters, frontiersmen and others, lotions of whiskey or brandy are in common use as applications to wounds and sores, and they could not find a more efficient agent for the purpose, when conjoined with thorough cleanliness of the lesions.

Internally, in small quantities taken just before or during a meal, alcohol is an efficient aid to digestion, especially in the aged and feeble, or persons who are greatly exhausted by overwork. In the atonic indigestion of nervous and depressed subjects and in cholera infantum, good brandy is universally found to be beneficial. Care must be taken, however, not to exceed the amount which agrees with the case, for large quantities precipitate pepsin, paralyze the gastric secretions, and set up a subacute gastritis, which will become a chronic one if the indulgence is persisted in, with eventual atrophy of the gastric glands.

In the form of a sparkling wine, as champagne, or as brandy and soda-water, alcohol may control vomiting from many causes, especially that of yellow fever and sea-sickness. A single full dose of strong whiskey or brandy is often a very efficient combatant of fainting or of collapse, by its prompt reflex stimulation of the circulation. Diarrhea of simple form may be checked by a dram of good brandy, acting as a tonic astringent to the intestines. An attack of acute coryza, or a cold from exposure beginning with a chill, may frequently be aborted by a full dose of spirits in hot water taken just before going to bed, for the purpose of relaxing the peripheral vessels and thus promoting diaphoresis and restoring the disturbed balance of the circulation. In anemia and chlorosis good red wines are almost indispensable, also in convalescence from acute diseases, sudden and profuse hemorrhages, and many other morbid conditions. In phthisis alcohol does good service if it promotes assimilation and assists digestion, shown by increase of the body-weight during its employment. It is invaluable in poisoning by cardiac depressants and snake-venom, and in cardiac failure from any cause.

In many fevers, Alcohol is often very serviceable, but may do harm if used therein without discrimination. Its powers of lessening oxidation, of being itself oxidized in the body and acting as a food, of reducing body-temperature and promoting perspiration and sleep, are all indications for its beneficial employment in most febrile conditions; while its stimulant action on the heart may be available in such diseases as typhoid fever, lobar pneumonia, etc., to tide that organ over a brief period of depression or a condition of impending collapse. Furthermore, for some unexplained reason, it often slows the pulse in fever, and when it does so its moderate use will be of general benefit to the patient. The danger is that if continuously given in such affections it may fail to make the required impression when an emergency calling for it occurs. The best rule to observe for its administration in typhoid, diphtheria, pneumonia and other fevers is to withhold it until the first sound of the heart becomes feeble and dull, and then to use it boldly but not excessively. Many authorities urge its continuous administration in diphtheria, probably from a belief in its antiseptic action on the poison in the blood, similar to that which it undoubtedly exercises against the venom of the rattlesnake. It is an absolute necessity in the treatment of acute lobar pneumonia, if the patient has been accustomed to its daily use as a beverage; but in other subjects of this disease it is best given at the crisis only, to tide the patient over a brief period of extreme danger.

Recent researches as to the action of alcohol upon vital resistance to infection, by Drs. Abbott and Deléarde, seem to show that it has a decidedly injurious influence upon animals inoculated with cultures of the germs of certain infectious diseases. Alcoholized rabbits died when inoculated with *Streptococcus pyogenes* and *Bacillus coli communis* in attenuated cultures which did not kill non-alcoholized control ones. Animals vaccinated against tetanus and afterwards alcoholized, soon lose their immunity; and those vaccinated against tetanus and at the same time alcoholized, do not readily acquire immunity. Similar results were obtained with regard to rabies and anthrax. The conclusion is drawn that strong doses of alcohol should not be administered to persons suffering from certain infectious diseases, as pneumonia, or from certain intoxications, as that produced by snake-venom, during which an increase in the number of leucocytes appears to be a necessary part of any process leading to the cure of the patient.

The use of alcoholic beverages in moderate quantity by healthy persons is violently condemned by extreme total abstinence advocates, who make use of garbled quotations from medical authorities to support their arguments. Physicians generally agree with Mr. Lawson Tait, who declared himself "fully persuaded after thirty years of life, as hard in work and as full of responsibility as well could be, that the moderate use of alcohol is a necessity in our modern life." Dr. Robert Farquharson sums up the case for moderate drinking as follows: "All stimulant is unnecessary for the young and for people living perfectly healthy lives. But, under the stress and struggle of modern civilization, few of us beyond middle age are placed under normal physiological conditions, and a little alcohol helps us to round the corners, and to plane away the asperities of existence. In turns it may be a stimulant, or a sedative, or a tonic, or a digestive, or an actual food; and unless we run on into excess, no physical damage can possibly be done to our tissues. The argument in its favor, when wisely and prudently used, seems complete. It does us good, and can do us no harm."

ALETRIS, Colic-root (Unofficial),—is the rhizome of *Aletris farinosa*, the Star-wort, an indigenous perennial plant which grows in grassy places and in sandy woods. It contains starch, and a bitter principle, but no tannin. This plant was formerly official, and is now widely advertised by the proprietors of an *Aletris Cordial*, as being tonic, emetic, purgative, diuretic, carminative, sialogogue and anti-rheumatic, also "the most powerful of uterine stimulants," a specific for dysmenorrhea and a wonderful remedy for colic, dropsy, and chronic rheumatism. It is little more than a simple bitter in small doses, though in very large ones it may prove emeto-cathartic. Dose, of the powdered root, gr. x; of the infusion (℥j to the pint), ℥ss.

ALLIUM, Garlic, is the bulb of *Allium sativum*, a plant of the nat. ord. Liliaceæ, indigenous to Asia, but cultivated in Europe and America. Its odor is pungent and disagreeable and its taste warm and acrid. It contains a *Volatile Oil*, which consists mainly of the Sulphide of Allyl $(C_3H_5)_2S$, on which its qualities depend. Allied species are *Allium Cepa*, the Onion, and *Allium Porrum*, the Leek.

Syrupus Allii, *Syrup of Garlic*,—contains 20 per cent. of Garlic, Sugar and Dilute Acetic Acid. Dose, ʒj–iv, according to age.

Garlic, Leeks and Onions are stimulants to the digestion and to the nervous system, and are supposed to have a special influence upon the bronchial secretion. Garlic is also thought to be emmenagogue and anthelmintic. It promotes diaphoresis and diuresis, and acts as a tonic and carminative. Many persons use it as a condiment. Large doses will often produce gastric irritation, flatulence, hemorrhoids, headache and fever. In domestic practice it is frequently employed as an external application in the cutaneous eruptions of children, and as a poultice or liniment in infantile disorders of many kinds. Internally it is of real benefit in feeble digestion and flatulence, chronic catarrhal affections of children, nervous and spasmodic coughs, and nervous vomiting.

ALNUS, Alder-Bark (Unofficial),—is the bark of *Alnus serrulata*, the common American Alder, a small tree of the nat. ord. Betulaceæ. It has similar properties to those of *A. glutinosa*, the European Alder, and *A. urcana*, the Tag Alder, and contains a tannic acid, an oil, and a resin. The bark and leaves are astringent and bitter, and are chiefly used as gargles for the throat, as local applications to wounds and ulcers, and to restrain the secretion of milk. Dose of the powerful bark gr. x, in decoction or infusion, several times a day. The Tag Alder is highly recommended as a hemostatic.

ALOE, Aloes,—is official in the two following-named varieties, also as the Purified Aloes preparation, and the neutral principle, Aloin.

Aloe Barbadensis, *Barbadoes Aloes*,—is the inspissated juice of the leaves of *Aloe vera*, a plant of the nat. ord. Liliaceæ. It occurs in opaque, hard, orange-brown masses, of saffron-like odor and bitter taste.

Aloe Socotrina, *Socotrine Aloes*,—the inspissated juice of the leaves of *Aloe Perryi*, nat. ord. Liliaceæ, inhabiting the island of Socotra and the eastern coast of Africa near the Red Sea. The plant has orange-colored flowers and resembles in appearance the American aloe or century-plant (*Agave americana*). Aloes occurs in soft masses of a yellowish-brown color, fragrant odor and bitter taste, soluble in alcohol and in boiling water. It contains a peculiar volatile oil, a resin, and *Soaloin*, $C_{15}H_{16}O_7$, a variety of the principle *Aloin*, which is common to all varieties of aloes,—also *Aloetic* and *Chrysammic Acids*. Dose, gr. j–v.

ALOE CAPENSIS, Cape or Natal Aloes, from *Aloe ferox*, is another variety of the same plant.

Aloinum, *Aloin*,—a neutral principle obtained from several varieties of Aloes, chiefly the above-named, which yield respectively Barbaloin and Soaloin. These principles are soluble in 60 parts of water, 20 to 30 of alcohol, and in 380 to 470 of ether. Soaloin is soluble in 9 parts of acetic ether. Dose, gr. ss–ij.

Preparations.

Aloe Purificata, *Purified Aloes*,—prepared from Socotrine Aloes by melting and mixing with ⅙th of Alcohol, straining and evaporating. The product is in irregular, dull-brown, brittle pieces, almost entirely soluble in alcohol. From it are prepared the following preparations. Dose, gr. j–v.

Extractum Aloes, *Extract of Aloes*,—prepared by mixing 1 part of Socotrine Aloes with 10 parts of Boiling Distilled Water, standing 12 hours, decanting, straining and evaporating. Dose, gr. ss–v.

Tinctura Aloes, *Tincture of Aloes*,—has of Aloes 10, Glycyrrhiza 20, Diluted Alcohol to 100 parts. Dose, ℥ ss–ij.

Tinctura Aloes et Myrrhæ, *Tincture of Aloes and Myrrh*,—Aloes 10, Myrrh 10, Glycyrrhiza 10, Alcohol and Water to 100 parts. Dose, ʒ ss–ij.

Pilulæ Aloes, *Pills of Aloes*,—each has Aloes and Soap, 2 grains of each.

Pilulæ Aloes et Asafetidæ, *Pills of Aloes and Asafetida*,—each pill contains gr. $1\frac{1}{3}$ of each ingredient.

Pilulæ Aloes et Ferri, *Pills of Aloes and Iron*,—each pill contains gr. j each of Aloes, Sulphate of Iron and Aromatic Powder, with Confection of Rose.

Pilulæ Aloes et Mastiches, *Pills of Aloes and Mastic, Lady Webster's Pill*,—each pill has of Aloes gr. ij, Mastic gr. ss, Red Rose, gr. ss.

Pilulæ Aloes et Myrrhæ, *Pills of Aloes and Myrrh*,—each pill contains of Aloes gr. ij, Myrrh gr. j, Aromatic Powder gr. ss, mixed with Syrup.

Pulvis Aloes et Canellæ, *Powder of Aloes and Canella* (Unofficial),—contains the powdered bark of *Canella alba*. Dose, gr. v–xx.

Pilulæ Lapacticæ, *Lapactic Pills* (Unofficial),—each pill contains of Aloin gr. $\frac{1}{4}$, Strychnine gr. $\frac{1}{60}$, Extr. Belladonna gr. $\frac{1}{8}$, Ipecac gr. $\frac{1}{16}$. Dose, ij–viij.

Aloes is also a constituent of Pilulæ Rhei Compositæ and Tinctura Benzoini Composita (which see, under Rheum and Benzoinum respectively).

Physiological Action and Therapeutics.

Aloes is a tonic-astringent and resin-bearing purgative, an emmenagogue and an anthelmintic against the thread-worm. As a cathartic it acts chiefly on the lower half of the large intestine, doses of gr. j–iv producing in about 10 hours copious soft evacuations with some griping pain. This effect is produced whether the drug be taken internally or absorbed from an exposed surface, so that it probably diffuses into the blood and is eliminated by the mucous membrane of the colon. It is a stomachic tonic in small doses, a stimulant of the hepatic functions, and an excitant of the pelvic circulation. It may cause abortion in the female and priapism in the male, and is said to have frequently produced hemorrhoids, which if existing it will aggravate. Given to nursing mothers it imparts a purgative quality to their milk.

Aloes is chiefly used in combination with Iron, Myrrh, Nux-vomica, etc., for amenorrhea and chronic constipation with atonic dyspepsia and hypochondriasis. It is curative in certain forms of hemorrhoids, especially those occurring after delivery and where the condition is not one of active pelvic congestion. It is also used internally and as an injection in gonorrhea, and for simple atonic jaundice. It must be avoided in irritable rectum, hemorrhoids of active form, menorrhagia and pregnancy, unless given in small doses and with care. The Pil. Aloes et Ferri is perhaps the most generally used agent in the anemia, amenorrhea and constipation of girls at the period of puberty.

ALTHÆA, Marsh-Mallow,—is the root of *Althæa officinalis*, a European plant of the nat. ord. Malvaceæ. It contains about 35 per cent. each of vegetable mucus and starch, with 2 per cent. of *Asparagin*, also pectous matter, sugar, fixed oil, but no tannin. It is a constituent of Massa Hydrargyri and Pilulæ Phosphori, and is much used as an excipient in extemporaneous pharmacy. Dose, indefinite.

Syrupus Althææ, *Syrup of Althæa*,—has of Althæa 5 per cent., and should be freshly made. Dose, indefinite.

Althæa is one of the best mucilaginous drugs, but has no active medicinal properties. It is used in Europe to make pectoral teas and syrups, and is extensively employed as a mucilaginous demulcent. The powdered root makes a good emollient poultice. In the Phar. Ger. a Compound Althæa Tea is official, which under the common name, "German Breast Tea," is a popular demulcent drink in bronchial affections, coughs, etc.

Asparagin is an organic principle, occurring in large rhombic crystals, and found in many other plants, as in the shoots of asparagus, vetches, potatoes, liquorice, the sweet almond, the root of the locust, etc. It is considered a derivative of *Succinic Acid*, and has diuretic properties, besides being sedative to the circulation. It may be used in ascites, especially in children, in the anasarca of Bright's Disease, and in gout. Dose, gr. ij–iij, in water.

ALUMEN, Alum, *Potassium Alum,*—is Aluminum and Potassium Sulphate, $Al_2K_2(SO_4)_4 + 24H_2O$, which, when the 24 molecules of water are driven off, becomes **Alumen Exsiccatum,** *Dried Alum,* $Al_2K_2(SO_4)_4$. Alum occurs in large, octahedral crystals, or cubes, of sweetish astringent taste and acid reaction. It is soluble in 9 parts of water and in 0.3 of boiling water, but is insoluble in alcohol. The Ammonia-alum (Alumini et Ammonii Sulphas) was formerly official, and is still sold and dispensed as Alum. Dose, gr. x–xx,—as an emetic ʒj for a child.

Alumen Exsiccatum, *Dried Alum,*—is a white, granular powder, slowly soluble in 20 parts of water at 59° F., and quickly soluble in 0.7 of boiling water. Dose, gr. x–xx.

Alum is an astringent, coagulating albumin and stimulating muscular contraction. At first it excites the flow of saliva and then markedly diminishes it. It coagulates pepsin and arrests digestion, stops peristalsis, and usually causes constipation, though sometimes inducing diarrhea. Although coagulating albumin, even in weak solution, it enters the blood, constricts the capillaries, arrests secretions, especially those of mucous surfaces, and stops capillary hemorrhage. In teaspoonful doses it is an efficient and non-depressant emetic. In large doses it is a gastro-intestinal irritant, one ounce and five-eighths of dried Alum having caused the death of an adult in eight hours.

Alum is used locally as an astringent in chronic catarrhs, leucorrhea, gonorrhea, hemorrhoids, bed-sores, ulcers, relaxed throat, colliquative sweats, catarrhal ophthalmia and granular lids. The dried powder is escharotic, destroying granulations and warty growths, and is used by insufflation in chronic nasal catarrh. Internally it is beneficial in gastric catarrh, gastralgia, enteralgia, passive hemorrhages, lead colic and constipation. As an emetic it is employed in croup, and it is a good antidote in lead-poisoning. Alum is best administered alone, as it forms precipitates with a large number of drugs.

ALUMINUM.—This metal is not official, though of its salts two are official besides Alum. They are—

Alumini Hydras, *Aluminum Hydrate, Hydrated Alumina,* $Al_2(OH)_6$,—is a white, light, amorphous, tasteless powder, insoluble in water or alcohol, but soluble in strong alkaline or acid solutions. Dose, gr. iij–xx in powder or mixture.

Alumini Sulphas, *Aluminum Sulphate*, $Al_2(SO_4)_3 + 16H_2O$,—is a white crystalline powder, soluble in 1.2 of water at 59° F., almost insoluble in alcohol. Used locally.

The Hydrate is a feebly astringent and desiccant powder, occasionally used in inflammatory skin affections as a local application, and internally in diarrhea.

The Sulphate is antiseptic and astringent. It has been used internally in diarrheas, but is chiefly employed in a 5 per cent. solution locally to ulcers, or in stronger solution (ʒ iij ad ℥ vj) in foul discharges from mucous surfaces. A saturated solution is a mild caustic, and may be used daily as a local application to enlarged tonsils, nasal polypi, ulceration of the os uteri, and various chronic enlargements. The Benzoinated Solution of Alumina is an unofficial preparation used for the same purposes.

Alumnol (Unofficial),—is an aluminum salt of naphtol-sulphonic acid, and is readily soluble in cold water. It is markedly antiseptic and astringent, and though precipitating gelatin and albumin, the precipitate is soluble in an excess of ether, so that when it is used on purulent discharges they do not clog up cavities, and desirable penetration below the surface is accomplished. It has been used both dry and in solution, as a dressing for wounds, ulcers, etc., also for acute inflammatory and parasitic affections of the skin, and in acute and chronic inflammations of mucous membranes. In 1 to 3 per cent. solution it makes a good injection for gonorrhea, the weaker solution destroying gonococci without increasing inflammation (Chotzen). A 4 per cent. solution is used by ophthalmologists to check lachrymal discharge during an examination of the eye. It neither irritates nor causes pain. It is four times as expensive in this country as in Germany, where it originated.

AMMONIACUM, Ammoniac,—is a gum-resin, obtained from *Dorema Ammoniacum*, a Persian plant of the nat. ord. Umbelliferæ. When triturated with water it readily yields a milk-white emulsion, and contains a *Volatile Oil*, which differs from that of Asafetida, in that it is neither sulphuretted nor phosphoretted. It also contains resin, gum, gluten, etc. Dose, gr. x–xxx.

Emulsum Ammoniaci, *Emulsion of Ammoniac*,—an emulsion with water of 4 per cent. strength, the resin being suspended by the contained gum. Dose, ℥ ss–j.

Emplastrum Ammoniaci cum Hydrargyro, *Ammoniac Plaster with Mercury.*—Ammoniac 72, Mercury 18, Oleate of Mercury 8 per cent., containing also Lead-plaster and Dilute Acetic Acid.

Ammoniac is a stimulating expectorant and a laxative, and has a mildly irritant action on the skin. Its actions are similar to those of Asafetida, but much less powerful. It is not much used, but may be employed with benefit in chronic bronchial affections, especially of the aged, the mixture with Ammonium Chloride or Carbonate facilitating expectoration and lessening wheezing. It is also recommended in asthma, and in glandular enlargements and indolent swellings the plaster is employed as a stimulating alterative and resolvent.

AMMONIUM, NH_4,—is a hypothetical compound radical, which does not exist in the free state, but in combination with acids forms salts which closely resemble those of the elements Potassium and Sodium. Many of its salts are official, as well as the aqueous solutions of the gas **Ammonia,** NH_3, which is produced during the putrefaction of all organisms and many organic nitrogenous compounds. Ammonia exists in the air and in the soil in the free state, and is contained in the products of the dry distillation of many nitrogenated compounds. The so-called "gas-liquor," a by-product in the manufacture of illuminating gas, when neutralized by hydrochloric acid, yields Ammonium Chloride, NH_4Cl, and from this salt are derived all the other ammonium compounds employed in medicine.

Preparations of Ammonia.

Aqua Ammoniæ, *Ammonia Water*,—is an aqueous solution of Ammonia, containing 10 per cent. by weight of the gas. It is a colorless liquid of pungent odor, acrid taste and strongly alkaline reaction. Dose, ♏v–ʒss, well diluted.

Aqua Ammoniæ Fortior, *Stronger Ammonia Water*,—contains 28 per cent. by weight of the gas. Sp. gr. 0.901 at 59° F.

Spiritus Ammoniæ, *Spirit of Ammonia*,—is a 10 per cent. solution of the gas in alcohol. Sp. gr. about 0.810. Dose, ♏x–ʒj, diluted.

Spiritus Ammoniæ Aromaticus, *Aromatic Spirit of Ammonia*,—contains Ammonium Carbonate, Aqua Ammoniæ, Oils of Lemon, Lavender, and Nutmeg, Alcohol and Water. Used in the Tinct. Guaiaci Ammoniata and the Tinct. Valerianæ Ammoniata. Dose, ʒss–ij.

Linimentum Ammoniæ, *Ammonia Liniment*,—has of Aqua Ammoniæ 35 parts, Cotton-seed Oil 60, Alcohol 5 parts.

Ammonium Salts and their Preparations.

Liquor Ammonii Acetatis, *Solution of Ammonium Acetate* (*Spirit of Mindererus*), is prepared by neutralizing dilute acetic acid with ammonium carbonate. It contains about 7 per cent. of the acetate and is an ingredient of Liquor Ferri et Ammonii Acetatis. It should be freshly made as it soon deteriorates. Dose, ʒj–℥j.

Ammonii Benzoas, *Ammonium Benzoate*, $NH_4C_7H_5O_2$,—minute four-sided, laminar crystals, soluble in 5 of water and 28 of alcohol at 59° F. Dose, gr. v–xv.

Ammonii Bromidum, *Ammonium Bromide*, NH_4Br,—prismatic crystals or a granular salt, soluble in 1½ of water and 30 of alcohol at 59° F. Dose, gr. ij–xx, well diluted. Children bear it well if epileptic from reflex causes; a child 1 year old will tolerate gr. v every 4 hours (Barton).

Ammonii Carbonas, *Ammonium Carbonate*, $NH_4HCO_3.NH_4NH_2CO_2$,—occurs in white masses consisting of both the bicarbonate and carbonate, which on exposure to air become a white powder (acid carbonate). Soluble in 5 parts of water. Dose, gr. iij–x. For children small doses, gr. ¼–ij, frequently repeated.

Ammonii Chloridum, *Ammonium Chloride* (*Sal-ammoniac*), HN_4Cl,—a white, crystalline powder, of saline taste, and slightly acid reaction; soluble in 3 of water and very sparingly in alcohol. Dose, gr. j–xx.

Trochisci Ammonii Chloridi, *Troches of Ammonium Chloride*,—each contains 1½ grains of the Chloride. Dose, j–x troches.

Ammonii Iodidum, *Ammonium Iodide*, NH_4I,—a deliquescent, granular, white salt, soluble in 1 of water and in 9 of alcohol at 59° F. Dose, gr. ij–x.

Ammonii Nitras, *Ammonium Nitrate*, NH_4NO_3,—colorless crystals or fused masses, soluble in 0.5 of water and in 20 of alcohol at 59° F. Only used to prepare Nitrous Oxide Gas for anesthesia by heating to 365° F.

Ammonii Valerianas, *Ammonium Valerianate*, $NH_4C_5H_9O_2$,—in white, quadrangular plates, deliquescent; very soluble in water and alcohol. Dose, gr. j–v.

Raspail's Eau Sedative (Unofficial),—consists of the Aqua Ammoniæ ℥ij, Sodii Chloridum ℥ij, Spiritus Vini Camphorat. ℥iij, Aqua ℥xxxij. For local use.

PHYSIOLOGICAL ACTION.

The gas **Ammonia** is intensely alkaline and irritant to mucous membranes; inhaled producing spasmodic cough and a sense of suffocation. Its prolonged inhalation will produce violent inflammation of the air-passages and edema of the glottis. It stimulates the nasal branch of the fifth nerve, exciting the vaso-motor centre by reflex action, and thus raising the arterial tension. Applied to the skin and allowed to evaporate, it has a slight rubefacient effect, but if evaporation be prevented it penetrates the epidermis, and has a powerfully vesicant action. The Aqua, swallowed undiluted, may cause death quickly by suffocation from the action of its vapor upon the air-passages; if not, it may excite gastro-enteritis accompanied by coma, differing in the latter respect from potassium or sodium poisoning. After absorption it stimulates both the respiration and the circulation by direct action on their respective nerve-centres. Ammonia exists normally in the circulation, where it keeps the fibrin in solution and thus maintains the fluidity of the blood. It increases the glycogenic function of the liver, and is converted finally into urea. It is a powerful irritant to muscular tissue, causing tetanic contraction and subsequent rigor mortis when directly applied.

All Ammonium Salts stimulate and finally paralyze the spinal cord, motor nerves and muscles, in animals, but the order and intensity of the action vary with the salts employed, some having a predominating influence on the cord, others on the motor nerves. In general they may be said to form a series, of which the members at one end stimulate the cord, and those at the other paralyze both the cord and the motor nerves. At the stimulant end are Ammonia and the Chloride; at the paralyzant end the Iodide; the Bromide, Phosphate and Sulphate lying between (Brunton). In medicinal doses they act on man as stimulating expectorants, in large quantity they injure the structure of the red blood-corpuscles, and if long continued they produce rapid emaciation by impairing digestion and increasing tissue-waste.

The Chloride has decided cholagogue powers, increases the excretion of urea, in 20-grain doses is purgative, and is considered to have a selective action upon the gastric mucous membrane. The Carbonate is a powerful and very diffusible stimulant; when administered internally in moderate doses it is probably decomposed by the HCl of the gastric juice, nascent ammonia being set free and absorbed. It stimulates the respiratory centre, acts as a stimulating expectorant, and in very small doses stimulates the secretion of the gastric juice. It is also emetic, and has been supposed to prevent iodism when administered conjointly with Potassium Iodide. The Solution of the Acetate is an active diaphoretic if the body be warm, or a diuretic if it be cool. In wineglassful doses it will counteract many of the immediate effects of alcohol. The Phosphate is diuretic, and is believed to decompose the insoluble sodium urate in the blood, converting it into the soluble salts ammonium urate and sodium phosphate, and thus promoting its elimination. The Benzoate is also diuretic, and like Benzoic Acid passes out of the system in the urine as hippuric acid. It stimulates the liver, and acidifies the urine where there is phosphatic tendency thereof. The Nitrate and Sulphate are only used for the preparation of other salts, while the Iodide, Bromide and Valerianate correspond in action to that of their titular bases, and are described under their respective titles, IODUM, BROMUM and VALERIANA.

Antidotes and Antagonists.

When Ammonia is inhaled in excess give HCl vapors by inhalation to form the chloride; if taken in solution, give *Vegetable Acids*, also demulcents to protect the mucous surfaces. Its physiological antagonists are the cardiac sedatives, Aconite, Digitalis, Veratrum, etc.

THERAPEUTICS.

The strong Solution of Ammonia may be used as a rubefacient and vesicant, and its vapor, by cautious inhalation, in syncope and the results of shock. Locally, it is a good application to bites of the less venomous reptiles and to the stings of insects. The Carbonate is used internally in the eruptive fevers, delirium tremens, continued fevers, pneumonia, etc., where much depression exists; as a stimulating expectorant in chronic bronchitis, in the broncho-pneumonia of children, and in cardiac asthma. It is highly recommended in scarlet fever in doses of 3 to 5 grains every one, two, or three hours, all acid drinks or fruits being prohibited while it is being administered. With ten-minim doses of tincture of capsicum in an ounce of some bitter infusion it is exceedingly efficient, in 5- to 10-grain doses, for the sinking sensations and craving for stimulants experienced by subjects of alcoholism. It may be used as an emetic in bronchitis, when the tubes are choked with mucus and the circulation of the patient is weak. It may also be employed by inhalation, and administered internally, for similar purposes as Liquor Ammoniæ.

In doses of 5 grains, administered hypodermically in the vicinity of wounds caused by poisoned arrows, the Carbonate was repeatedly used by Dr. Parke, Stanley's surgeon in Africa, with entire success in saving life when so employed immediately after injury. Those so wounded at too great a distance to receive this treatment invariably died within a short period of time.

The Chloride has high repute in catarrh of the stomach, with anorexia, bad taste in the mouth, flatulence, coated tongue, etc., in short, the symptoms of so-called "biliousness"; also, in chronic congestion of the liver, jaundice from catarrh of the bile-ducts, nervous and sick headaches, myalgia, amenorrhea, muscular rheumatism and neuralgia. In the latter affection it should be given in 30-grain doses several times a day. It is also efficient in bronchial catarrh without fever, and in chronic bronchitis when the secretion is scanty and tough. It is remarkably efficient in straightening up a victim of acute alcoholism; administered to one on the verge of delirium tremens, in dose of ½ drachm in half a pint of water, swallowed at one draught, it is said to restore the patient's faculties so quickly as to astonish those who have never seen it so employed. Locally, in solution, it has been well employed as a lotion for inflammatory swellings, as sprains, inflamed joints, orchitis, etc.; also to allay itching in prurigo, to remove ecchymoses and glandular enlargements. *Eau Sedative* is often a good local application in headaches.

The Solution of the Acetate is especially beneficial in the exanthemata, influenza, coryza, anomalous febrile conditions of children, acidity and vomiting; also in acute alcoholism and in erysipelas when there is feeble circulation, cyanosis and delirium. It is frequently combined with spirit of nitrous ether, as a diuretic and diaphoretic in febrile affections. The Phosphate is particularly applicable to gout and lithemia, and is a very efficient cholagogue. The Benzoate is useful in cystitis with alkaline urine and phosphatic deposits, as it acidulates the urine, at the same time stimulating and disinfecting the mucous coat of the bladder.

Aqua Ammoniæ has been administered by intra-venous injection, with efficacy and safety, in sudden or threatened thrombosis, impending cardiac paralysis during chloroform anesthesia, and in poisoning by hydrocyanic acid and other cardiac depressants. In the same manner, it has been employed, but unsuccessfully, in poisoning by the bite of venomous reptiles. Ten drops of the strong Liquor are diluted with three parts of water, and carefully injected into a vein, all air being rigorously excluded from entrance thereinto.

The therapeutics of the Iodide, Bromide and Valerianate are enumerated under the titles IODUM, BROMUM and VALERIANA respectively.

AMYGDALA, Almond.—The seeds of two varieties of *Prunus Amygdalus*, nat. ord. Rosaceæ, namely *Amygdala amara* and *Amygdala dulcis*, are official, together with several preparations, some prepared from one variety, some from another, while one is from either and one from both. *Amygdalin*, $C_{20}H_{27}NO_{11}$, is a crystalline glucoside, existing in Amygdala amara but not in Amygdala dulcis; while the ferment *Emulsin* is common to both varieties. The reaction which occurs between these two substances in the presence of water produces Hydrocyanic Acid. (See *ante*, page 99.)

Amygdala Amara, *Bitter Almond*,—is the seed of *Prunus Amygdalus*, var. *amara*, a tree of the nat. ord. Rosaceæ, indigenous to Asia, but cultivated in many other parts of the world, especially in Spain and the Balearic Islands. The seed has an embryo of bitter taste, which, when triturated with water, emits an odor of Hydrocyanic Acid.

Amygdala Dulcis, *Sweet Almond*,—is the seed of *Prunus Amygdalus*, var. *dulcis*, a tree of the nat. ord. Rosaceæ. The bitter and sweet almond trees are identical botanically, and the fruits and seeds of the two varieties resemble each other closely, only differing in taste and the presence of Amygdalin (see above). The sweet almond is largely cultivated about Malaga and in California.

Preparations.

Oleum Amygdalæ Amaræ, *Oil of Bitter Almond*,—is a volatile oil, of peculiar and aromatic odor, bitter, burning taste, and neutral reaction; soluble in 300 of water, but freely in alcohol and ether. Dose, ♏¼-j, in mixture.

This essential oil, one of the products of the reaction between Amygdalin and Emulsin (see *ante*, p. 99), contains a varying quantity of Hydrocyanic Acid (3 to 14 per cent.), which may be removed by distillation with caustic potash. *Nitrobenzol*, Oil of Mirbane, closely resembles the oil of bitter almond, and like it is used for flavoring. It contains no Hydrocyanic Acid, but is a dangerous poison, producing toxic effects when inhaled, even in small doses.

Aqua Amygdalæ Amaræ, *Bitter Almond Water*,—is a weak solution of the Oil in Distilled Water (1 to 1000). Is only a flavored water. Dose indefinite.

Spiritus Amygdalæ Amaræ, *Spirit of Bitter Almond*, *Essence of Bitter Almond*, has of the Oil 1, dissolved in Alcohol 80, and Water added to 100 volumes. Dose, to be regulated by the quantity of alcohol desired.

Syrupus Amygdalæ, *Syrup of Almond*,—has of Bitter Almond 4 per cent., of Sweet Almond 14. Dose indefinite.

Emulsum Amygdalæ, *Emulsion of Almond*,—made of Sweet Almond 6 per cent., with Acacia, Sugar and Water. A demulcent drink, used as a vehicle for cough mixtures. Dose, ʒij–℥ss.

Oleum Amygdalæ Expressum, *Expressed Oil of Almond*,—is the fixed oil which is expressed from either Bitter or Sweet Almond. Used in Unguentum Aquæ Rosæ, and as a bland local application in skin affections.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

The bitter and sweet varieties of the species *Prunus Amygdalus* differ in action only through the agency of the principle Amygdalin contained in the former. The Sweet Almond is demulcent and nutritive, while the fixed oil expressed from either variety is a bland application, having the same action as Olive Oil. The action of the Bitter Almond and its oil is due to the Hydrocyanic acid contained in them (see *ante*, p. 99).

The Oil of Bitter Almond is used as a flavoring agent, and may be employed locally or internally in lieu of Hydrocyanic acid. The Syrup is somewhat sedative, but is generally used as a demulcent or for flavoring purposes. The Emulsion is used in catarrhal affections and as a vehicle for cough-mixtures. The poisonous character of the Bitter Almond and its essential oil (Oleum Amygdalæ Amaræ) should be kept in mind when prescribing them. Of 39 cases of poisoning by bitter almond preparations, the oil caused 28, the spirit 4, the almonds themselves 4, the water 2, and the emulsion 1.

The Expressed Oil of Almond is a good demulcent, also laxative in doses of ʒj to ʒij. It is used externally for excoriations, chapped hands and inflammatory affections of the skin, and may be applied in the external auditory canal for earache. *Almond Bread* is made from the cake remaining after the fixed oil is expressed from the sweet almond. The cake is ground into a meal or flour, and is an excellent substitute for wheat bread in the diet of diabetics, as it contains no starch.

AMYL NITRIS, Amyl Nitrite,—is a liquid containing about 80 per cent. of *Amyl Nitrite*, $C_5H_{11}NO_2$, together with variable quantities of undetermined compounds. It occurs as a clear, yellowish liquid, of ethereal and fruity odor, aromatic taste, and neutral or slightly acid reaction, extremely volatile, insoluble in water but freely soluble in alcohol, ether, chloroform and benzin. It is produced by the action of nitric acid upon amylic alcohol, and when impure may contain nitric or hydrochloric acid. Dose,—internally ♏ ¼–j dissolved in alcohol,—by inhalation ♏ ij–v; but larger doses are probably safe.

Analogous Compounds.

Glonoinum, *Glonoin, Nitroglycerin, Trinitrin, Glyceryl Trinitrate*, $C_3H_5(NO_3)_3$,—is a clear, oily liquid, insoluble in water, but soluble in alcohol, ether, oils, etc., produced by the action of Nitric and Sulphuric acids upon Glycerin. It is a dangerous explosive, and should not be kept in stronger solution than 1 per cent. Dose, ♏ $\frac{1}{200}$ to $\frac{1}{50}$ or more, according to susceptibility. Official in the Spirit.

Spiritus Glonoini, *Spirit of Glonoin, Spirit of Nitroglycerin*,—is a 1 per cent. solution in alcohol. Dose, ♏ ½–x. The strong tinctures sold by the homeopathic pharmaceutists and official in their American Pharmacopœia is a 10 per cent. solution, or ten times the strength of the above. It is an extremely dangerous preparation, both as an explosive and as a medicine. (See *American Homœopathic Pharmacopœia*, 2d ed., Boericke & Tafel, 1883, page 235.)

Tabellæ Nitroglycerini (B. P.), *Tablets of Nitroglycerin*,—are tablets of chocolate, each containing gr. $\frac{1}{100}$ of pure Nitroglycerin. Dose, j–ij.

Sodii Nitris, *Sodium Nitrite*, $NaNO_2$, and **Potassii Nitris**, *Potassium Nitrite* (the latter unofficial),—are used as substitutes for Amyl Nitrite and Nitroglycerin. The former is a white, crystalline powder, deliquescent in the air, in which it gradually oxidizes to sodium nitrate; has a mild, saline taste, but no odor; very soluble in water, slightly in alcohol. Dose, gr. ss–iij, according to individual susceptibility.

Ethyli Nitris, *Ethyl Nitrite*, $C_2H_5NO_2$,—constitutes about 5 per cent. of Spiritus Ætheris Nitrosi. (See page 113 *ante*.)

PHYSIOLOGICAL ACTION.

Amyl Nitrite and the other Nitrites agree closely in their general action, producing great vascular dilatation by paralyzing either the sympathetic system, the vaso-motor centre or the muscular coat of the arterioles,—which, is yet undecided. They cause tumultuous action of the heart by relaxing its inhibition; lowered respiration, from paralysis of the respiratory muscles and impairment of the ozonizing function of the blood; diminution of sensation, motility, and reflexes; a sense of heat, but lowered body-temperature; also throbbing pain in the head, beating carotids, quickened pulse, flushed face and vertigo. The effect of an ordinary inhalation of Amyl Nitrite on man is very transitory, excepting the headache, which may last several hours. Of all the nitrites it is the most prompt but least enduring in action, and is best administered by inhalation. It causes sugar to appear in the urine and increases the quantity of urine voided. Mixed with blood it forms methemoglobin, which is not so readily deoxidized as hemoglobin, and under its influence the blood in the body becomes of a dark chocolate color both in the arteries and in the veins.

Nitroglycerin acts similarly, but less promptly, and its action is more enduring. Its headache is of intensely frontal character, and persists for hours after the other effects have passed off. It is more suitable than amyl nitrite for internal administration. Sodium Nitrite is also slower in action than amyl nitrite, and does not cause so much throbbing headache as nitroglycerin. It may be given in solution with water. The action of all these agents is probably due to the nitrous acid contained in them.

Antagonists.

Ergot, Belladonna, *Strychnine*, Brucine, Digitalis, Picrotoxin and all other agents which increase the functional activity of the spinal cord and sympathetic are antagonistic, though by reason of their slower rate of diffusion the antagonism may not be always available. Stimulants, artificial respiration, the alternate cold and hot douche, with cold to the head, and *Ergotin* or *Atropin*, subcutaneously, are the best means to be used in cases of poisoning by the Nitrites.

THERAPEUTICS.

The inhalation of Amyl Nitrite is a useful palliative in angina pectoris, epilepsy, tetanus, and many of the respiratory neuroses, as spasmodic asthma, whooping-cough, laryngismus stridulus, etc. It is also indicated in migraine of the pale-face form, and in the cold stage of intermittents and pernicious remittents, to prevent internal congestion,—also in convulsions of various kinds, including the puerperal form. It has been sometimes used in threatened death from chloroform anesthesia, and in poisoning by strychnine.

Nitroglycerin is employed with benefit in neuralgic dysmenorrhea and sea-sickness; also in chronic interstitial nephritis, by redistributing to the kidneys their blood-supply cut off by degeneration of the renal ganglionic centres. It promptly relieves hiccough, also migraine of spasmodic character, and has afforded immediate relief in neuralgia of the fifth and in sciatica. Its administration in angina pectoris, though not producing such prompt results as that of Amyl Nitrite, gives excellent and much more lasting effects. It is useful in the weak heart of the aged, or that from fatty degeneration, or when, as in Bright's disease, the arterial tension is above normal; also in irritable and overacting heart, which it relieves by rapidly dilating the arterioles and thereby lowering arterial tension.

Sodium Nitrite has been successfully used in angina pectoris, in hemicrania, and in asthma of purely bronchial and neurotic origin. It has also proved decidedly beneficial in the abnormally high arterial tension of chronic desquamative nephritis, especially when complicated with a weakened and dilated heart. Disagreeable symptoms caused by it may be prevented by prescribing it with spirit of chloroform or ammonia water and small doses of morphine.

AMYLUM, Starch, $C_6H_{10}O_5$,—is the fecula of the seed of *Zea Mays*, the Maize or Indian Corn, a plant of the nat. ord. Gramineæ. Though corn-starch is the only official kind, any other might be properly used, as the starch occurring in wheat, barley, oats, arrow-root, sago and tapioca, all of which were official in the U. S. P. of 1870. The last three are almost entirely composed of starch; wheat contains about 70 per cent., and rice nearly 90 per cent. The B. P. recognizes the starches from Maize (*Zea Mays*), Wheat (*Triticum sativum*) and Rice (*Oryza sativa*); the Ph. Ger. recognizes that from wheat alone.

Starch occurs in distinct grains (granules) which form irregular, angular masses, white, odorless and tasteless, of neutral reaction, easily pulverized and insoluble in alcohol, ether and cold water. In boiling water they swell, burst and form a mucilage which gelatinizes on cooling and gives a deep blue color on the addition of Iodine, the color disappearing on warming and returning on cooling. Under the microscope the granules are seen to be lenticular in form and differing somewhat in size and shape according to the plant from which they are derived. Those from wheat are large and small mixed and show concentrated striæ formed around a nearly central spot (hilum). Those from maize are smaller, have a hilum but no striæ. Those from rice are very minute, polygonal in shape, with a small hilum but no striæ.

Starch is converted into grape-sugar (glucose) by the action of diastase, ptyalin and pancreatin, also by boiling it with a dilute mineral acid, Dextrin being formed as an intermediate product. [See the article entitled PEPSINUM.] By hot, concentrated nitric acid it is converted into oxalic acid, but cold, fuming nitric acid dissolves it, forming an explosive compound. By the action of ferments it is finally converted into alcohol and carbon dioxide. $C_6H_{10}O_5 = 2C_2H_5OH + 2CO_2$.

Glyceritum Amyli, *Glycerite of Starch*,—has of Starch 10 parts, Water 10, Glycerin 80, triturated and heated to a transparent jelly. A vehicle for external applications.

Cetraria, *Iceland Moss*,—is the lichen *Cetraria islandica* found in northern latitudes, and contains *Lichenin* or lichen starch, which forms as a jelly when the plant is boiled in water; also *Cetraric Acid*.

Decoctum Cetrariæ, *Decoction of Cetraria*,—5 per cent. strength. Dose, ℥ij–iv.

Unofficial Derivatives and Analogues.

Dextrin,—is produced by the action of dilute acids on starch, and is an intermediate product in the conversion of starch into glucose. It is a transparent, brittle solid, soluble in water and dilute alcohol, is not fermentable, and is not colored by Iodine.

Maltum, *Malt*,—is the seed of *Hordeum distichum*, Barley (nat. ord. Gramineæ), caused to enter the incipient stage of germination by artificial means and dried. The germination is allowed to go far enough to develop the maximum amount of *Diastase*, the peculiar ferment by which the starch of the grain is converted into glucose. Malt is the source of beer, ale and whiskey, and is composed of the germinated, dead grains with their acrospires and radicles. It should be fresh, not darker in color than a pale amber, and of agreeable odor and sweet taste.

Extractum Malti, *Extract of Malt*,—is a liquid of the consistence of thick honey, containing all the soluble principles of malt in permanent form. It consists chiefly of diastase and glucose. Dose, ʒj–iv.

Horlick's Food,—is, like Mellin's and many other foods for children, a granulated Extract of Malt. *Hoff's Malt Extract* is another such preparation, containing alcohol, and corresponding to a concentrated beer.

Cellulose, $C_6H_{10}O_5$,—forms the basis of all vegetable fibre, and is isomeric with starch. It exists almost pure in cotton and in Swedish filter paper. *Pyroxylin*, Gun-cotton, is dinitro-cellulose.

Glycogen, *Animal Starch*,—closely resembles starch in its properties, being converted into glucose by the same agents which so act on starch. It exists in the liver of all animals.

PHYSIOLOGICAL ACTION.

Starch and its derivative grape-sugar are the chief members of the non-nitrogenous group of alimentary principles designated *hydrates of carbon* or *carbo-hydrates*, so called because in them the constituent elements H and O exist in multiples of the same proportions as in water. Starch is met with only in the vegetable kingdom, occurring in the form of granules in many seeds, roots, stems, and in some fruits. It is formed by plants from inorganic material under the influence of light, and is stored up in their seeds as food for the young seedlings. In order to be absorbed by the animal organism starch must undergo digestion by the action of the secretion of the pancreas and intestinal glands, which convert it first into soluble dextrine and then into grape-sugar, in which form it passes into the blood.

Food is required by the animal organism for two purposes, (1) to generate heat and other forms of force, (2) to repair the waste of the tissues. Both are essential to continued life, but the first is even more important than the second, for though the body may live a long time while wasting, it dies rapidly when the source of heat is removed or greatly lessened. The doctrine taught by Liebig—that the nitrogenous principles (albuminoids) are exclusively concerned in tissue repair, and the non-nitrogenous (starches, sugars and fats) in heat-production,—though not strictly accurate, still holds good as describing the leading office of each group.

The carbo-hydrates (starches, sugars, etc.) represent in vegetable food the same office which the hydrocarbons (fats) represent in animal food, namely—the maintenance of heat-production and other forms of force. The glycogen in the liver and the muscles is a store of insoluble fuel for emergencies, and is given up in the form of soluble grape-sugar as required. Any surplusage of carbo-hydrates goes to form fat, the adipose tissue of the body, another reserve of body-fuel. Being devoid of nitrogen the carbo-hydrates cannot enter into the actual structure of the tissues, the instruments of energy, but their oxidation supplies the motive power, they being the fuel of the body. When they are entirely burnt up and no more supplied the organism perishes of exhaustion. The adult human body of average size and weight requires according to its activity from 12 to 18 ounces of water-free carbo-hydrate material daily in some form of food.

Starch and sugar occur in vegetable foods in from three to five times greater amount than proteid material. The latter exists in greater proportion in the leguminous vegetables (peas, beans, lentils) than in meat, but in other vegetables the proteid is much less. Cereal grains are by far the most important vegetable foods, and among them *Wheat* is the one most generally used. Its constituents correspond with the requirements of the human organism more closely than those of any other grain; in fact both life and health can be maintained on wheat alone for a very long period. As ordinarily used, however, it is deprived of much of its nutritive value, white bread being made from wheaten flour from which not only the indigestible cellulose has been removed but part of the starch and sugar and a large proportion of the gluten, which is the proteid material of the grain. Brown or Graham bread contains nearly all the nutritive elements of wheat and is much more nutritious than white bread. *Rye* is a valuable grain, containing nearly the same proportions of starch, sugar, fat and proteid as wheat. *Rice* contains more starch than the others and its starch is very digestible, but it has practically no fat and only the smallest quantity of proteid. Its nutritive value is small, and it requires an oil and some albuminoid to be taken with it in order to make it a suitable diet. *Maize* is more nutritious than rice, but is less digestible. It contains much starch and some fat, but is deficient in proteid material (gluten). *Oats* are rich in fat but contain less starch than the other grains and require prolonged cooking to render them digestible. *Barley* ranks about as wheat, contains rather more proteid and is rich in phosphates and iron. It is highly nutritious and was the principal diet on which the Grecian athletes were trained. The *Potato* contains nearly 24 per cent. of a very digestible starch, is rich in salts and its juice is highly acid. It is an excellent antiscorbutic and is extensively used for food. *Arrow-root, Sago* and *Tapioca* consist almost entirely of starch, without fat or proteid, and are readily digested. *Peas* and *Beans* contain about 50 per cent. of starch and sugar, also 22 per cent. of legumin or vegetable casein, albumin, etc.—a very large proportion of proteid material, more in fact than exists in any kind of meat. They are rich also in fat and salts, and form the best vegetable substitute for animal food. They are somewhat indigestible and require prolonged cooking before being eaten; but they are an excellent food, alone nourishing both men and beasts for a long time.

The excessive consumption of starchy food delays tissue-metamorphosis, produces a superabundance of adipose tissue, and often causes acidity and flatulence. Undigested starch passes into the feces and the urine becomes saccharine in many cases. Profound disease does not necessarily follow, but if decided corpulence is produced the muscular fibres of the heart and many voluntary muscles decrease in size, the cardiac action becomes enfeebled and the usual results thereof are manifested. The deprivation of starch can be borne well for a long time if fat is taken with the food, but if both starch and fat are excluded and nitrogenous material is alone supplied, illness results in a few days. [See the article entitled ALBUMIN, *ante*, page 120.]

THERAPEUTICS.

The principal affections in which the carbo-hydrates are imperatively required are gastric disorders, diarrhea, dysentery, excessive secretion of bile and other hepatic disorders, Bright's disease, alcoholism, gout and rheumatism. In acute and continued fevers there is often an almost complete inability to take and digest any kind of food. This may last for weeks, the result being that the patient dies from so-called exhaustion, in reality starvation due to want of fuel-food, the human fire going out in the absence of material to feed it. In such cases the need of soluble carbo-hydrate food must be supplied. Well-baked flour which contains much soluble dextrin, also milk-sugar or grape-sugar, should be added to the beef-teas which are so much used in the sick-room. Grape-sugar is digested starch and a very soluble carbo-hydrate; it may therefore be administered in lemonade or any other drink which the patient fancies. In gastric disorders accompanied by much acidity an uncrystallizable sugar like grape-sugar is preferable to cane-sugar or beet-sugar, the latter being crystallizable sugars and readily undergoing the acetous fermentation. In diarrheal conditions the proper food is milk with some digestible carbo-hydrate, as arrow-root, sago, or tapioca. Rice-water makes an excellent drink in diarrhea and dysentery, and has often arrested these conditions without medicinal aid. In the treatment of Bright's disease and chronic alcoholism a diet of carbo-hydrates should be inculcated and animal food reduced to a very small quantity. The same rule is imperative in the management of gout, especially when this disease occurs in persons of sedentary habits. In acute rheumatism the diet should be wholly non-nitrogenous, except for broken-down and debilitated subjects, or where serious nervous or cardiac complications exist.

Starch is medicinally inert. It is employed as a vehicle for medicated enemata, as an antidote in poisoning by Iodine or Bromine, and as a protective and absorbent powder applied by dusting over the skin. Mixed with glue it makes an excellent stiff bandage for surgical purposes.

Malt Extract, containing good food elements, is directly nutritive, and indirectly so from the presence of the ferment Diastase, which converts the starch of bread or other farinas into sugar. It is usefully employed in wasting diseases, and mixed with milk or oleaginous foods it aids their digestion and assimilation. It may be used to form a syrupy mixture with preparations of Iron or Cinchona.

Cetraria is nutrient, demulcent and feebly tonic. It has a popular reputation in pulmonary affections, and is of value in chronic catarrhs, chronic bronchitis, purulent discharges from mucous surfaces generally, also in chronic diarrhea and dysentery.

ANIMAL EXTRACTS (Unofficial).—The organs, tissues and secretions of animals were extensively employed as medicinal agents in ancient times, and many of them were official in the pharmacopœias of the last century. At present the only ones so recognized are the digestive ferments (pepsin and pancreatin), ox-gall (fel bovis), and the secretion of the preputial follicles of the beaver (castoreum) and of the musk-ox (moschus). The first definite attempt in recent regular practice to apply animal tissues to the cure of disease was made in 1852 by Dr. Jackson of Philadelphia, who used as a tonic the blood of bullocks carefully dried *in vacuo*, giving 5 to 10 grains thereof at a dose. Since then the drinking of fresh bullocks' blood has become a common practice in certain diseases. Raw meat was administered as a remedy for diabetes at St. Bartholomew's Hospital in London in 1874. The powdered Russian cockroach (Blatta orientalis) is still used as an efficient diuretic in dropsies, and preparations of the bodies of various spiders and toads, also bee and serpent venoms, are recognized remedies in homeopathic practice.

The use of glandular extracts as remedies in disease is very old. It was revived in 1889 by Brown-Séquard's advocacy of orchitic (testicular) extract for impotence and several nervous affections, and was profoundly stimulated by the results of Dr. Murray's suggestion in 1891 of thyroid extract for the cure of myxedema.

Testicle Extract is fully noticed in the "*Seplasium or the Druggist's Shop Opened,*" by W. Salmon, published about 1685. In this book the author describes the testicles taken from man or beast as consisting of "a Flegm, Spirit, Sulphur and Volatile Salt joined with some Earthy Particles; the chief used are from Bull, Horse, Goat, Ram, Boar and Buck," which were cut out, carefully dried, and used to make a tincture, a spirit, an oil and a volatile salt. Salmon further says that "their virtues are very great, for they refocillate the Spirits,—Natural, Vital and Animal,—comfort the Head, Brain and Nerves, and resist all Diseases afflicting them, ... they restore in Consumptions, ... are also good against the Collick, and particularly strengthen the Instruments of Generation and provoke Lust." The same extract was also recommended by J. Fr. Leaulté, who wrote in 1717. According to Pliny the ancient Greeks and Romans ate the testicle of the ass for the purpose of curing impotence.

According to the theory promulgated by Brown-Séquard, all glands, in addition to their ordinary secretions, elaborate certain materials of unknown chemical composition, which pass into the blood and perform therein definite functions of some kind. We now know that such is the case with the thyroid gland, we suspect that it is equally true of the thymus, the spleen and the adrenals, and we have reason to believe it
probable that the other glands of the body exert influences here-
nsuspected over distant parts of the organism.

The effect of the entire removal of the thyroid, the pancreas or the adrenal glands is to produce the symptoms of characteristic and fatal disorders; but if a portion of either gland be left behind these toxic symptoms do not develop, and the same is true of the thyroid and pancreas if, after their entire ablation, a portion be engrafted upon the peritoneum. It is evident therefore that the disorders so produced are of auto-toxic origin, the result of chemical poisons in the blood which were previously neutralized, destroyed or eliminated by the removed gland or some of its secretions. It has also been shown that the subcutaneous injection of an aqueous extract of the dead gland will dispel the toxic phenomena which follow the removal of that gland, proving that the active principle thereof is a chemical substance existing in the gland itself, and that the previous immunity was not due to any action of its living cells other than that required to produce the active agent. The discovery that ablation of the testicles causes retrogression of the hypertrophied prostate, and that removal of the ovaries will cure osteomalacia, as also the long-known facts that castrated individuals usually grow very obese and develop massive skeletons, while giants are generally endowed with atrophied testicles,—clearly point to the same conclusion.

The animal extracts form a group of active medicinal agents which are proving worthy of careful investigation both physiologically and clinically. The study already given to them has yielded much new knowledge, and has shown indubitably that their employment as therapeutic agents rests on a scientific basis; but most of them are as yet on trial, and the limits of their utility in medicine are by no means defined. They contain leucomaïnes, extractives and other chemical substances, all of which possess physiological powers, many proving distinctly poisonous when their excretion is prevented. Excepting thyroid extract and perhaps some others, the animal extracts are active medicinally only when injected subcutaneously or by the rectum, as most of them when given by the mouth are destroyed or altered in the stomach, or prevented by the liver from entering the general circulation. Physiological chemists are endeavoring to separate their active principles, a line of research which promises more accurate and positive results. It is already demonstrated that some of their principles are the most powerful of all alteratives, and that others possess the most energetic action upon the muscular fibres in the walls of the arterioles.

The initial doses of many animal extracts should be very small, in order to avoid the possible systematic disturbance which has been frequently noticed by clinical observers as following on their administration.

Sodium Phosphate in solution, administered hypodermically, is considered by Luton and Crocq, of Rheims, to be equally effective in reconstructive power with the animal extracts. (See under the title PHOSPHORUS.)

Thyroid Extract is the most efficient member of the group of animal extracts. Its administration has been eminently successful in the treatment of myxedema, which a few years ago was classed among the incurable diseases, but is now considered curable by thyroid feeding, or by the use of an extract of the thyroid gland of the sheep. Myxedema is a combination of symptoms due to thyroid absence or inadequacy, and occurs as a result of the removal of the gland or of disease impairing its functional activity. It is characterized by imperfect oxygenation of the blood, lowered body-temperature, impairment of intellect, memory and speech, also increase of the fibrous tissue and subsequent mucoid degeneration thereof, with thickening of the skin, drying of the surface and shedding of the epithelial structures. When caused by ablation of the thyroid the disease is fatal to cats and dogs in a very few days, but their life has been saved by engrafting a portion of the removed gland in other situations, and also by intravenous injections of thyroid extract. This treatment of the idiopathic form of myxedema was suggested and commenced by Professor George R. Murray, of the University of Durham, in 1891, and has since proved remarkably successful. At first the remedy was administered hypodermically, but it was soon found that the raw gland fed to the patient was equally efficient, or that a dry extract may be used. The latter represents the entire thyroid, divested only of its water, is easily administered and proves very efficient, improvement being usually noticed within a very few days, and going on steadily to apparent perfect recovery if the remedy is continued. The thickening of the skin disappears, the normal body heat returns, and speech, memory and intelligence are restored. In mild cases recovery is effected in a few weeks, but in severe ones several months of treatment are necessary; and in most cases the symptoms of the disease return when the thyroid treatment is stopped, disappearing again when it is resumed. It is probable that the subjects of this disease will require to take a certain quantity of the remedy regularly and continuously for many years, perhaps for life.

A large dose of thyroid extract gives rise to marked constitutional symptoms, and several cases are recorded in which it has caused death. Nausea, vomiting, neuralgic pains in the back and limbs, and cardiac irritability and weakness even to syncope, are the principal symptoms observed during its excessive use. It produces a distinct fall of the blood-pressure, even though the cardiac rate and force may remain unaffected, this effect being evidently due to its increasing the calibre of the vessels (Schäfer and Oliver). In one case all the symptoms of diabetes developed under its continuous administration for psoriasis (James). In another instance a typical attack of gout came on, but subsided when the extract was stopped, and reappeared when it was again administered (Harris).

Thyroid extract has produced great amelioration in cretinism (congenital myxedema) which is a thyroid disease, and the improvement has been steady and progressive in many cases while the remedy was used, but ceased as soon as it was discontinued. In psoriasis, eczema, ichthyosis, pityriasis rubra, lupus, universal alopecia and some other skin affections, it has been employed as a stimulant of the cutaneous functional activity with most satisfactory results; several cases of psoriasis treated with this remedy alone recovering completely in the course of a few weeks (Bramwell). In exophthalmic goitre thyroid extract has been beneficial, and though some observers report ill effects from its use in this disease, others show that they were due to a primary aggravation of symptoms which subsides when the dose is largely reduced, and is then followed by distinct improvement under the administration of a very small quantity of the remedy (Bruns, etc.). Complete disappearance of the goitre has however rarely been observed (Kinnicut). In the insanity of the adolescent, climacteric and puerperal periods, the thyroid treatment has seemed to be especially beneficial (Bruce); but in several cases of insanity where there was parenchymatous (not cystic) enlargement of the thyroid, the extract was used without result upon the mental affection though it diminished the size of the goitre and caused a marked loss of weight (Reinhold). In many cases its continued administration has produced emaciation, which fact suggested its employment for the reduction of obesity, and it has been successfully used for this purpose in many cases (Guttmann). A loss of weight at the rate of from 2 to 11 pounds per week is produced in some cases; but after a time a limit is reached, beyond which further loss does not occur. Thyroid extract has given satisfaction in several other affections, including tetanus, ozena, uterine fibroma and carcinoma, and some forms of syphilis. It has been successfully used to promote consolidation in obstinate fractures, having well-recognized effects in disordered nutrition of osseous tissue (Gauthier). It has seemed to act as an efficient galactagogue in some cases, increasing both the flow and the quality of the milk (Stawell).

The chemical constituents of thyroid extract include *Iodothyrin*, which seems to be the active principle. It exists in combination with the proteids (albumin and globulin) which are found in the colloid secretion of the follicles of the gland. Iodothyrin contains Iodine in varying amount and a large proportion of nitrogen, also sulphur and phosphorus. So far as studied it appears to represent the therapeutic power of the extract, and is administered in tablet form and in doses of gr. $\frac{1}{60}$ gradually increased.

Liquid Thyroid Extract is prepared from the fresh thyroids of the sheep, by macerating them in equal parts of glycerin and water for 24 hours, and then squeezing through fine calico. For hypodermic use the water employed in the menstruum should contain 0.5 per cent. of carbolic acid. A *dry extract*, three times stronger than the liquid one, is made by expressing the juice from the glands, mixing it with sugar of milk, and drying it on glass plates at a temperature of 90° F. The dose of this product is from 2½ to 5 grains at first, thrice daily by mouth; which dose may be gradually increased as long as it causes no systemic disturbance. The *Thyreoidin* prepared by Parke, Davis & Co. of Detroit, is a dry powder, each grain of which represents 10 grains of the fresh gland or 1.6 grain of desiccated thyroid. The dose of this preparation is ½ grain two or three times a day, to be increased at the discretion of the physician.

Thyreo-Antitoxin is a substance obtained by Dr. Fränkel from the thyroid gland, to which he has given the above name and assigned the formula $C_6H_{11}N_3O_5$. It is inodorous and tasteless, and produces rapid emaciation. It is improperly named an antitoxin.

Thymus Extract. The thymus gland is active only during the developmental period of life, and becomes atrophied about the age of two years. The suggestion has been made that an extract thereof may prove useful in diseases characterized by defective development, as rachitis and pseudo-hypertrophic paralysis. It has been used with reported benefit in leucocythemia, chlorosis, idiopathic and pernicious anemia, and in Paltauf's so-called "status thymicus." It appears to be useless in exophthalmic goitre, but beneficial in the other form. Of 30 cases of goitre treated with it 20 were improved but only 2 were cured (Kinnicut). The mode of preparation and dose are similar to those of thyroid extract.

Bone Marrow Extract.—Red bone marrow has been long known as one of the sources of the red blood corpuscles, and it is thought probable that it contains chemical ingredients which may stimulate the production of blood cells by other blood-forming organs in which such natural stimulus may be lacking. In pernicious anemia the marrow of the long bones shows characteristic changes, which fact suggested the administration of red bone marrow as a remedy for that disease. This treatment has proved remarkably successful even in cases which were apparently hopeless. It was first suggested by Dr. Dixon Mann, who administered a glycerin extract thereof in cases of hemophilia, chlorosis, profuse hematemesis and other anemic affections, with good results. Its employment is indicated in disorders characterized by hyperfluidity of the blood, from whatever cause; and it may render good service in any debilitating or blood-impoverishing affection, and in convalescence after severe osteitis. The raw marrow, freed from spicules of bone, may be administered to the amount of about 3 ounces daily in divided doses; or it may be given as a paste made with wine, glycerin, and gelatin. Tablets, containing from 1½ to 5 grains each of the dried marrow, are on the market and may be used if preferred. *Carnogen* is a proprietary preparation containing red bone marrow and hemoglobin.

One of the most striking cases recorded is that of the gardener patient of Professor Fraser of Edinburgh. Under the use of raw bone marrow by the stomach his blood corpuscles increased in number from less than 900,000 to over 4 millions per c.c., the proportion of hemoglobin rose from 18 to 35 per cent., and the man became well enough to resume his occupation.

Nuclein is a proteid substance, possessing a large proportion of Phosphorus in the form of *Nucleinic Acid*, which is combined with a highly complex base, the latter being different in the various tissues. Nucleins are the chief chemical constituent of cell nuclei, and their number is limited only by the varieties of the cells. They are found in both animal and vegetable tissues; wherever there is a nucleus we find a nuclein. They are generally insoluble in dilute acids, but are soluble in dilute alkalies, and resist peptic digestion. Their functions in the organism are supposed to be (1) that of a natural antiseptic, to destroy toxic products which may accumulate through faulty elimination, and (2) that of a natural bactericide, to resist microbic invasion. Two nucleins only have been clinically studied in this country, that obtained from yeast-cells and that from the thyroid and thymus glands.

Nuclein is harmless, causing no functional derangement when administered by the stomach or subcutaneously, even in very large doses. When injected hypodermically its principal effect is to produce a very marked increase of leucocytic activity (an artificial leucocytosis), both in healthy and in tuberculous subjects. The increase is observed to affect chiefly the polynuclear leucocytes; it varies in degree with the individual, appears within three hours after administration of the nuclein, and disappears after forty-eight hours or thereabouts (Huber). The effect is to energize any existing inflammation, or to awaken such when comparatively quiescent, as in latent tuberculosis (Sée).

Nuclein was introduced into medicine by Professor Vaughn of the University of Michigan. Its employment as a therapeutic agent is based on the assumption that for immunity against and the cure of bacillary diseases we should look to non-toxic germicides of cellular origin, and to substances which stimulate the activity of those organs whose function it is to protect the body against such invasion. As the nucleins apparently fulfil these requirements they have excited considerable attention among the advocates of animal extracts. Nuclein has been successfully used in diphtheria, suppurative tonsillitis and other suppurative disorders, also in chronic rheumatism and malaria, chronic bronchial catarrh and neurasthenia, and has been employed in tuberculosis with encouraging results (Vaughn). In one case an ulcer of twenty years' standing was cured in four months by the local application of nuclein. A physician reports his own case, one of genito-urinary tuberculosis, as apparently cured by nuclein injections. In simple anemia, chlorosis, typhoid fever, debility from any cause, and convalescence from acute diseases, such as pneumonia and influenza, the beneficial results of nuclein medication are prompt and permanent (Aulde). As bactericides the nucleins may prove useful by reason of their harmlessness to the human subject.

Nucleins are prepared from separate animal tissues and glands, as the thyroid, thymus, liver, spleen, etc. (*animal nucleins*); also from all the tissues and glands combined (*protonuclein*), and from yeast cells (*vegetable nuclein*). Vaughn uses a solution of yeast nuclein, containing 1 per cent. of nucleinic acid, prepared by Parke, Davis & Co. The dose of this solution is 30 minims, administered hypodermically, and increased daily as long as no unfavorable symptoms appear. Tablets of nuclein are on the market, for administration by the mouth, the dose being 1 grain or more, as may be deemed advisable.

Protonuclein is the trade-name of an extensively advertised product, which is said to be a combination of nucleins obtained from all the available lymphoid structures of bullocks and pigs, including the entire brain, the pancreas, liver, spleen, salivary glands, thyroid, thymus, gastric and intestinal glands, etc. The manufacturer claims that it is "the true tissue-builder of the organism" and its "natural antitoxic agent," and publishes the usual florid literature, which includes clinical reports of the therapeutic efficacy of protonuclein in some forty-five different affections. It is sold in tablets and powder; also in a special powder containing no milk-sugar, and intended for inhalations and injections. The dose is 3 grains every 3 or 4 hours.

Orchitic Extract, *Didymin, Testicular Juice,*—was the subject of a communication to the Société de Biologie at Paris, in 1889, from Professor Brown-Séquard, in which the aged and distinguished writer declared that he himself had experienced a wonderful degree of rejuvenescence after its use, and recommended it as a general tonic for the aged and for subjects of impotence or a debilitated nervous system. In subsequent communications made to the Académie des Sciences by Brown-Séquard and his assistant D'Arsonval, it was claimed that general paralysis, locomotor ataxia, contractures, and certain forms of insanity, also affections due to organic lesions of the nervous system or impairment of its functions, are cured or ameliorated by injections of testicular juice; and that organic or constitutional diseases due to defective nutrition of the organs, as anemia, glycosuria and tuberculosis, may be arrested by this procedure. Its remedial effects they held to be due to the action of a ferment or diastase contained in the fluid, which replaces the natural ferments produced by normal testes and other glandular organs of the body. Although Brown-Séquard's claims for this agent were undoubtedly extravagant, and his assertions as to the results obtained therefrom were exaggerated, subsequent experience has confirmed his general statement regarding its effects, and the restorative power of testicular juice when injected subcutaneously is now admitted.

Testicular extract injected into the human subject produces a steady increase of oxyhemoglobin in the blood, the cardiac force is strengthened, the vascular tone is exalted, and the oxygenation of waste products is promoted, as shown by the increased excretion of urea and the lessened amount of phosphoric acid in the urine. Intestinal peristalsis is slightly stimulated, the mind becomes clearer and more active, and the body temperature is usually raised but may remain unaffected. The crude extract is said to be mildly bactericidal. These effects closely coincide with those produced by *Spermine* (see p. 164), and this substance is believed by Poehl to be the active principle of the juice, but it does not possess the powerful reconstructive properties of the latter, and cannot be efficiently substituted therefor.

This extract has been employed by many competent physicians in several diseases, often with most beneficial results. It is a powerful tonic, especially in the decrepit subject of old age or exhaustion from wasting disease, as it stimulates the tissues and organs to renewed activity and endows the body with greater strength and with a feeling of increased well-being. It has been used in general adynamia, anemia, atonic gastro-intestinal affections, scurvy, malaria, epilepsy, cancer, nymphomania, perverted sexual habits, impotence, neurasthenia, hysteria, melancholia, diabetes, tuberculosis, hemiplegia, paralysis agitans and locomotor ataxia. In the last-named disease this remedy has shown the best results obtained therewith; and under its administration the characteristic pains have ceased, steadiness and accuracy of motion have increased, and in some cases the ataxia has wholly disappeared. In diabetes it has been more satisfactory than pancreatic or any other organic extract. Under its administration in anemia one physician observed the hemoglobin to increase from 3 to 14 per cent. every three weeks; and in tuberculosis it has caused the temperature to recede to normal, the cough to lessen, the appetite and weight to increase, and the general condition to improve in every way. In sexual neurasthenia it has frequently proved to be of great benefit. No specific action is claimed for it in any of these affections, but all observers agree that it acts by stimulating functional activity. Many of the results observed have been ascribed to mental suggestion, but after the application of check experiments in similar cases the weight of evidence was found to be in favor of the remedy.

D'Arsonval prepares this extract or emulsion in the following manner. The testicles of bulls, enveloped in their membranes, are washed in a 10 per cent. solution of sublimate, and again with sterilized water, are each divided into five or six parts, placed in aseptic glycerin (a pint to the pound of testicle) and allowed to macerate therein for 24 hours. An equal quantity of a 5 per cent. solution of common salt in boiled water is then added, the mixture is filtered and sterilized by being subjected to a pressure of 30 atmospheres of carbon dioxide. The dose is 10 to 20 minims, hypodermically once daily or every other day, with strict aseptic precautions as to the syringe used and the site of injection; the latter should be washed with a 1 to 1000 sublimate solution or a 2 per cent. solution of carbolic acid. The extract seems to have little or no effect when given by the mouth, but is efficient when used by the rectum. Some observers believe that it is dangerous by hypodermic administration, on account of its proneness to decomposition when prepared by the above method; and one experimenter has made an extract from the crude juice for administration by the mouth, which he claims to have used in a thousand cases.

The composition of the emulsion prepared by the above process is very complex, but it is supposed to include at least four active principles, viz.—*Phosphorized Albumins*, in large quantity, *Lecithin*, known as phosphorized fat, *Spermine*, and *Nuclein*. The first two have undoubted value as nerve foods, the third is believed to increase the oxygen-carrying power of the blood corpuscles, and the last possesses bactericidal properties. The combination should prove of value as a remedy in many morbid conditions.

Phospho-Albumen. Under this trade-name and the sub-title *Syrup of Di-Oleyl-Lecithin*, an animal extract is prepared in Chicago, which is said to be derived solely from the testes, spinal cords and brains of bulls. The juice is sterilized by D'Arsonval's carbon dioxide process, and is mixed with simple syrup as a preservative menstruum and some flavoring material. It is supposed to contain lecithins, spermine, nuclein, and phosphorized albumins, and is apparently a favorite tonic with many prominent physicians of Chicago. It is not patented, copyrighted or advertised, is sold only on physicians' prescriptions, and its manufacturers assure the profession that so far as their methods of promotion are concerned it will remain practically inaccessible to the laity.

Spermine has been found in the form of a phosphate in the thyroid and thymus glands, the spleen, the ovaries and the blood, as well as in the testes. Dr. Poehl believes it to be an alkaloidal product of the retrogressive metamorphosis of albumins (a leucomaïne), and a most powerful intraorganic restorative of the oxidizing properties of the blood. He states that it should not be regarded as a specific for any particular malady, but should be used as a means of promoting oxidation in the body. It has been employed with decided benefit in ataxy and delirious epilepsy (Poehl), as a tonic in tuberculosis (Upenski), also in senile marasmus and the nervous affections of the aged (Victoroff). The Hydrochlorate is used hypodermically, in doses of ⅙ grain twice daily, in the morning and at noon, avoiding evening administration, as it may cause insomnia. No reaction follows its injection.

Brain Extract, *Cerebrinin,*—is obtained from the gray matter of the sheep's brain by digestion in 5 times its weight of pure glycerin and then adding an equal quantity of a 12 per cent. solution of common salt. Its effects are almost identical with those of orchitic extract, the most noticeable being increased strength and a feeling of well-being, regulation of the organic functions and increase of the cardiac force. It has been employed with benefit in locomotor ataxia, neurasthenia and allied affections, nymphomania, perverted sexual habits of cerebral origin, hysteria, melancholia, insomnia, the general debility of malaria, chlorosis and even more profound anemias (C. Paul); also in cases of defective development of the spinal apparatus, as Friedrich's ataxia. Mental derangement is not helped by it, or at most but temporarily. The dose is 16 minims (1 cc.) once daily or every other day, administered subcutaneously.

Cerebrine is an extract of the entire brain of the ox, prepared by Dr. Hammond of Washington, by digestion for six months in a mixture of glycerin, alcohol, and a saturated solution of boric acid, and filtration through porous stone. The dose is 5 minims diluted with an equal quantity of distilled water at the time of administration by hypodermic injection. Dr. Hammond prepared similar extracts of the spinal cord (*medulline*), the heart (*cardine*), the pancreas (*pancreatine*), etc., and advocated their use medicinally on the organopathic theory that they are curative of depressed conditions of the corresponding human organs.

Pineal Extract.—The pineal gland is present during the entire life of the individual, and its removal has been followed in animals by structural changes in the central nervous system. It is thought that the substance of this gland may act remedially in organic and functional affections of the brain attended with failure of cerebral nutrition, as chronic softening, chronic mania and dementia.

Pituitary Extract.—The complete removal of the pituitary body (or gland) gives rise to symptoms which occur in a definite order, beginning with lowered temperature and loss of appetite, then twitchings, tremors and nervous phenomena, and finally dyspnea and death. Many of these symptoms have abated considerably after the administration of pituitary gland substance or an extract thereof. This organ has been found enlarged in cases of myxedema in which the thyroid was functionally absent, and other observations point to some connection between it and the disease known as acromegaly. Internally administered it causes increase of the cardiac force and rate, and a rapid rise of the blood-pressure due to direct contraction of the vessels. It is administered with the view of reestablishing perverted brain nutrition and function, and also with the object of supplying tone and structural growth to the entire nervous and muscular systems, on which its secretion seems to act as an alterative. Of 13 cases of acromegaly treated with pituitary preparations 7 showed varying degrees of improvement, 5 none, and 1 became worse. In 2 cases the violent headache and neuralgic pains in the limbs were diminished, and in one case decrease of the affected extremities occurred (Kinnicut).

Adrenal Extract. Ablation of the suprarenal glands in guinea-pigs and frogs is followed by serious nervous disturbances, shown by lowering of the body-temperature and progressive paralysis, and culminating in convulsions and death by failure of respiration. Brown-Séquard made these observations in 1856, and later showed that the subcutaneous injection of extracts of the healthy glands in such cases restored the animals to almost a normal state for a time. In 1895 Schäfer and Oliver demonstrated that the secretion of these glands strongly stimulates the muscular system by direct action, especially affecting the vaso-motor apparatus and the cardiac muscle, causing contraction of the arterioles and an extraordinary rise of the blood-pressure, followed by slowing and strengthening of the heart's action through the vagus and the cardiac motor ganglia. These effects are of short duration and are produced by a very small quantity, the $\frac{1}{10}$th of a grain of the dried gland causing a maximal result on the heart and arteries in a dog of twenty pounds weight: hence it is concluded that the active principle is capable of producing a marked physiological effect in the dose of $\frac{1}{800}$th of a grain for an adult man. The active principle, *Epinephrine*, $C_{17}H_{15}NO_4$, is an unstable alkaloid found only in the medulla of the gland and rapidly destroyed in the system. Though produced in very small quantity its probable function is to preserve the normal tone of muscular tissue, especially that of the blood-vessels.

By internal administration this extract has given good results in nasal, pulmonary and gastric hemorrhage, acute and chronic bronchitis, bronchial asthma, congestion and edema of the lungs, edema of the glottis and diabetes insipidus. Internally and locally it has proved of very great benefit in the treatment of hay-fever. It has been employed in Addison's disease, pernicious anemia and diabetes mellitus with some benefit in a few cases. It may be found useful in chronic muscular affections, especially those involving loss of tone or degenerative changes, and will probably be found valuable in all conditions in which the vaso-motor tone is impaired. Being a powerful but temporary stimulant of the heart it may be used cautiously in cardiac weakness, in failure of the heart from any cause and in valvular diseases of that organ.

By local application the angiostenotic properties of suprarenal extract have been successfully utilized in the treatment of local congestions, inflammations and hemorrhages, especially those of the eye, nose and throat. It is an excellent hemostatic for hemorrhage following operations on the nose, and it is used as an application to inflamed tissues prior to their being anesthetized by cocaine, also to the mucous membrane of the turbinated bodies in ulceration or hypertrophy thereof.

The preparation employed is the powdered gland of the sheep, dried *in vacuo*, the dose of which is gr. iij–v, in tablets or capsules, every two or three hours. For local use 4 to 50 per cent. sterile, aqueous solutions are applied, as a spray or by cotton swabs or a brush, directly to the affected part. It should not be used hypodermically.

Splenic Extract.—Excision of the spleen, or the serious impairment of its functions by disease, is usually followed by marked tissue changes and great susceptibility to alterations of temperature, especially in malarial subjects. The substance of this organ has been used medicinally in various disorders of the blood, with the idea of supplying to that tissue some material which may be necessary to its health. The possession of bactericidal power by some secretion of the spleen is strongly indicated by certain facts, among which are the evident incompatibility of tuberculosis and malaria and the enlargement of the spleen in acute infectious diseases, as though working against the germs thereof. It has therefore been suggested that the splenic substance of animals naturally immune against certain of these diseases be employed as a remedy therein,—for example, in tuberculosis, malaria and typhoid fever. By this treatment it is hoped that some light may be thrown on the functions of this organ, as has so recently been done in the case of the thyroid gland. Dr. H. C. Wood has reported excellent results from splenic extract in the treatment of exophthalmos. The improvement in some of his cases began soon after the commencement of the hypodermic administration of the remedy, and continued until the thyroid enlargement had entirely disappeared. The general nervousness vanished and the extrusion of the eyeball lessened, but while the cardiac action was greatly reduced the heart remained irritable on excitement.

Lymphatic Extract.—An extract prepared from the lymphatic glands of animals has been employed in exophthalmic goitre, lymphadenoma, and other glandular swellings, but there are no trustworthy reports as to the results.

Pancreatic Extract.—In many cases of diabetes decided structural changes have been observed in the pancreas after death, and the ablation of this gland in animals is followed by emaciation and glycosuria; but these symptoms will not occur if a portion of the pancreas is left, or if a part of it be engrafted on the peritoneum after its removal from its proper location. These facts have suggested the probability of the possession by the pancreas of power over carbohydrate metamorphosis, through the action of some substance elaborated by the peculiar, vascular epithelioid tissue which occurs in isolated patches throughout its substance, and which is not found in any other duct-bearing gland in the body. Upon this theory the pancreas, both in substance and extract, has been administered as a remedy for diabetes, but the results have been negative in nearly all the cases. A few instances are recorded in which its use was followed by some temporary amelioration of the symptoms of the disease.

Parotid Extract.—An extract of the parotid gland has been employed, by Dr. Robert Bell, of Glasgow, with good results in ovarian disorders, particularly enlarged and tender ovaries associated with dysmenorrhea, metrorrhagia, chronic endometritis and subinvolution of the womb.

Ovarian Extract.—The substance of the ovaries has been administered with some benefit in the nervous manifestations and pathological conditions which occur when the ovarian functions are partially or wholly arrested, as in cirrhosis or malignant disease thereof, or after the operation of ovariotomy. It is said to be a serviceable remedy in cases of depression or other mental disturbance coincident with the climacteric.

Uterine Extract.—The substance of the uterus has been employed as a remedy in those disorders and cachexiæ which seem to be consequent on the removal of this organ and its appendages. The available data are not, however, sufficient to enable any conclusions to be formed as to its efficacy.

Mammary Gland Extract has given satisfaction in fibroma and carcinoma of the uterus, also in menorrhagia, dysmenorrhea and enlarged and sensitive womb (Bell).

ANISUM, Anise,—is the fruit of *Pimpinella Anisum*, a European plant of the nat. ord. Umbelliferæ. It occurs in ovate bodies, ⅙ inch long, hairy, of grayish color, aromatic odor, and sweet, spicy taste, resembling conium fruit in appearance. Dose, gr. x–xx.

Oleum Anisi, *Oil of Anise*,—is a volatile oil distilled from *Anise*, and represents the medicinal qualities of the plant. It contains *Anethol* ($C_{10}H_{12}O$) or Anise-camphor, congeals at 50° to 59° F., is soluble in an equal part of alcohol, and is an ingredient of Tinctura Opii Camphorata, Trochisci Glycyrrhizæ et Opii, and of the two following preparations. Dose, ♏j–v.

Aqua Anisi, *Anise Water*,—has in 500 parts 1 of Oil of Anise triturated with Calcium Phosphate, and mixed with distilled water. Dose, indefinite.

Spiritus Anisi, *Spirit of Anise*,—is a 10 per cent. solution of the oil in alcohol. Dose, ʒj–ij.

The Volatile Oil is the active constituent of Anise. It has a slightly stimulant action on the heart and the digestive organs, and liquefies the bronchial secretion, being probably excreted in part by the bronchial mucous membrane. It is a favorite flavoring ingredient of cough-mixtures, and relieves slight intestinal colic and flatulence in children. In full doses it has weak narcotic power.

ANTHEMIS, Chamomile,—the flower heads of *Anthemis nobilis*, a European perennial of the nat. ord. Compositæ, collected from cultivated plants. They contain a volatile oil, a camphor and a bitter principle, but no alkaloid. There are no official preparations. An infusion (ʒiv to Oj) may be given in doses of ℥j–ij.

Oleum Anthemidis, *Chamomile Oil* (Unofficial),—the volatile oil, is of a dark blue or green color, and is composed of various ethers, the Angelates and Valerianates of Butyl predominating. Dose, ♏ij–x, on sugar.

Chamomile is a stomachic tonic. It improves the appetite and aids digestion by increasing the vascularity of the gastric mucous membrane. In large doses the warm infusion is emetic, and perhaps diaphoretic, though the latter action is chiefly due to the hot water. The oil is remarkably efficient in reducing reflex excitability in frogs, even after its excitation by Strychnine or Brucine.

Chamomile is popular in domestic practice. An infusion is used internally for many infantile complaints, and externally as a fomentation to relieve pain, as in colic, etc. The oil is very efficient in reflex cough, pulmonary catarrh, acute dyspepsia, diarrhea of children, spasmodic asthma, whooping-cough, colic, and the spasmodic and pseudo-neuralgic affections of hysterical women. It should prove extremely useful in poisoning by Strychnine, from its power over reflex excitability.

The *Chamomilla* of the homeopaths is the *Matricaria Chamomilla*, or German Chamomile, official in the U. S. Pharmacopœia as MATRICARIA, which see.

ANTIMONIUM, Antimony, Sb.—Metallic antimony is not official, and is not used in medicine. It is represented, however, by the following official salts and preparations, viz.—

Compounds of Antimony and their Preparations.

Antimonii et Potassii Tartras, *Antimony and Potassium Tartrate, Tartar Emetic,* $2KSbOC_4H_4O_6.H_2O$,—small white crystals or a granular powder of sweet, disagreeable metallic taste, soluble in 17 of water at 59° F., and in 3 of boiling water, insoluble in alcohol. Dose, gr. $\frac{1}{16}$–$\frac{1}{4}$, but after tolerance is established as high as gr. ij may be given. It is an ingredient of the first two following, viz.—

Vinum Antimonii, *Wine of Antimony,*—has of Tartar Emetic 4, Boiling Distilled Water 65, Alcohol 150, White Wine to 1000. Contains about 2 grains of Tartar Emetic to the ℥, and is an ingredient of Mistura Glycyrrhizæ Composita. Dose, ♏v–xv.

Syrupus Scillæ Compositus, *Compound Syrup of Squills, Cox's Hive Mixture, Hive Syrup* (see under SCILLA),—contains about 1 grain of Tartar Emetic to the ℥, with Squill, Senega, etc. Dose, ♏j–ʒj, cautiously in children.

Antimonii Oxidum, *Antimony Oxide,* Sb_2O_3,—a heavy gray powder, insoluble in water or alcohol, but readily and wholly soluble in Hydrochloric or Tartaric Acid solutions. Dose, gr. j–iij. It constitutes ⅓d of—

Pulvis Antimonialis, *Antimonial (or James') Powder,*—consists of the Oxide of Antimony 33 parts, with 67 of Calcium Phosphate. Dose, gr. iij–viij, every 3 hours as a diaphoretic, larger doses for emetic and cathartic effects.

Antimonii Sulphidum, *Antimony Sulphide,* Sb_2S_3,—is the native sulphide, purified by fusion, and as nearly free from Arsenic as possible; steel gray masses, or a black, lustreless powder, insoluble in water or alcohol. Dose, gr. ¼–j.

Antimonii Sulphidum Purificatum, *Purified Antimony Sulphide,*—Sb_2S_3,—is purified by maceration in Aq. Ammoniæ, washing and drying. Dose, gr. ¼–j.

Antimonium Sulphuratum, *Sulphurated Antimony, Kermes Mineral,*—is chiefly Sb_2S_3, with a very small amount of Sb_2O_3. A reddish-brown, tasteless powder, insoluble in water or alcohol, and a constituent of Pil. Antimonii Compositæ. Dose, gr. j–v.

Pilulæ Antimonii Compositæ, *Plummer's Pills,*—each pill contains about gr. ½ each of Calomel and Sulphurated Antimony, with Guaiac and Castor Oil.

PHYSIOLOGICAL ACTION.

Tartar Emetic in its action represents the other official antimonial preparations, being a cardiac, arterial and general depressant, a protoplasmic poison, a systemic and local emetic, a specific gastro-intestinal irritant, an expectorant and a diaphoretic. Like Aconite, Arsenic, Hydrocyanic Acid and Potassium, it is destructive to protoplasm, destroying function in all nitrogenous tissue, and paralyzing the spinal cord, the motor nerves, the muscles and the sensory nerve terminations. It is especially depressant to the heart-muscle and the cardiac motor ganglia; it combines with the red blood-corpuscles, lessening their oxidizing power, lowering the blood-pressure and reducing the body-temperature. Its taste is styptic and one of its earliest effects is the production of constriction of the fauces. It promotes waste and rapid excretion of waste products, carbonic acid and urea being especially increased. Being eliminated by all the excretory organs, including the skin, it excites follicular inflammation at the points of elimination; resulting in an eruption which is popular at first, then becomes vesicular, and finally pustular, the pustules being umbilicated like those of variola. This same eruption is also produced by the application of the drug to the skin with friction. Aphthous ulcerations, extending from the mouth to the stomach, with salivation and painful deglutition, may also result from its continued use.

In small doses Tartar Emetic stimulates secretion in the bronchial and salivary glands, the stomach, intestinal canal, liver and pancreas. In larger doses it excites nausea, vomiting and purging, with evacuations like the "rice-water discharges" of cholera, and great prostration of the vital powers. Toxic doses produce similar symptoms, besides epigastric pain, cyanosis, delirium, cramps, motor and sensory paralysis, suppression of urine and collapse,—the same phenomena as in Asiatic cholera.

The Sulphide occurs native, and is the source from which the other compounds are prepared. It seems to be inert medicinally. Sulphurated Antimony owes its efficacy to the small quantity of the oxide contained in it, and as this is variable, the action of the preparation is uncertain. The Oxide has similar action to that of Tartar Emetic, but being insoluble in water, it is of much less certain activity.

Antidotes, Antagonists, and Incompatibles.

Tannic Acid, or any substance containing it, is the antidote, forming the insoluble tannate. *Opium*, Alcohol, Ether, and other antispasmodics are physiological antagonists. Demulcent drinks should be freely administered to protect the mucous membranes. Alkalies and Salts of Lead decompose Tartar Emetic.

THERAPEUTICS.

Tartar Emetic was formerly much employed as an antiphlogistic on account of its power to cut short acute inflammations of sthenic type, but its use was greatly abused, so that it has now gone out of fashion as a remedy. The contra-stimulant treatment of pneumonia and other inflammatory diseases, by large doses of this salt after tolerance was established, is only worthy of reference as an historical fact. The same may be said of its external use as a counter-irritant as well as of its employment as an emetic, in both of which capacities it is too severe, while its emesis is too tardy in action to be of any value in poisoning. It is, however, a very efficient agent in many grave affections, if used in small doses (gr. $\frac{1}{60}$—$\frac{1}{40}$); being highly efficacious in acute inflammatory affections of the respiratory tract, especially pneumonia, broncho-pneumonia, acute edema of the lungs, feverish and catarrhal colds, bronchitis, laryngitis and tonsillitis. In many respects it acts like Aconite in these and kindred affections, producing copious diaphoresis, slowing the pulse and allaying restlessness. It is considered a good remedy in puerperal peritonitis, mammitis, and orchitis, in lumbago and other muscular rheumatisms, also in photophobia and in gastric indigestion after beer-drinking. In still smaller doses (gr. $\frac{1}{100}$ hourly) it is particularly efficient in catarrhal inflammations of the respiratory mucous membrane in children, accompanied by rattling breathing and much mucus, which is expelled with difficulty. Such cases often simulate asthma, the attacks being marked by cough, wheezing, and difficult respiration, with sibilant râles in the chest, and usually follow on severe colds or on measles. The Compound Syrup of Squill is commonly used as an expectorant and nauseant in the treatment of bronchitis and croup. The quantity of Tartar Emetic in it (gr. j to the ℥) should be remembered when administering it to children. (See under SCILLA.)

The Oxide is chiefly employed in the form of James' Powder (Pulvis Antimonialis) for its mild diaphoretic qualities. The Sulphide is not used in medicine. Sulphurated Antimony is very uncertain in action and is but little used. The Compound Pill of Antimony (Plummer's Pill) was devised to obtain mercurial results without writing Hydrargyrum on a prescription.

ANTIPYRINUM, Antipyrin, *Phenyl-dimethyl-pyrazolon*, $C_{20}H_{18}N_4O_2$,—unofficial in the United States, but official in the Br. Ph. under the name ***Phenazonum***, Phenazone,—is a crystalline substance obtainable from phenyl-hydrazine, and prepared by a patented and complicated process. It is a synthetical base, forming salts which are analogous to those of Ammonium; and occurs as colorless and inodorous scaly crystals, with a bitter taste, freely soluble in water, alcohol and chloroform, less soluble in ether. It gives a deep *red* color with ferric chloride, a deep *green* with nitrous acid, and with nitric acid a *yellow* color which deepens to *crimson* on warming. It is not irritant to the stomach or the tissues and may be administered hypodermically.

Dose and Administration.

The Br. Ph. states the dose at from gr. iij to gr. xx. An average adult dose may be placed at gr. x. For children the dose is gr. ¼ per year of age between 2 and 5 years, gr. ½ per year from 5 to 10, not exceeding gr. v at a dose for any child under 15 years.

Antipyrin has but little flavor, is not unpleasant, and is therefore readily taken by children, in which respect it is greatly superior to Quinine. It may be administered in compressed tablets, each having from 1 to 5 grains;—or in Aromatic Elixir,—say gr. lxxx in ℥iv, of which solution each ʒ contains gr. ijss. If vomiting result, the same dose may be dissolved in half its weight of *hot* water, and injected hypodermically while warm.

Incompatibles.

Antipyrin may be decomposed when brought into contact with Nitrous compounds, a new and poisonous substance being supposed to be formed, of uncertain composition, but resembling the Anilin greens. The mixture of this drug with Spiritus Ætheris Nitrosi is therefore highly dangerous if this supposed reaction is at all likely to occur.

It is more or less decomposed or thrown out of solution by a large number of chemical compounds and other preparations, of which the following are the most important, viz.:—

Acid, Hydrocyanic, Dilute.
Acid, Tannic.
Butyl-chloral Hydrate.
Chloral Hydrate.
Cinchona, Decoction.
Cinchona, Fluid Extract.
Catechu, Infusion (conc.).
Ferrum, Sulphate.
Ferric Salts in Solution.
Hamamelis, Tincture.
Iodine, Tincture.
Arsenic and Mercury, Solution of the Iodides of.
Mercuric Chloride.
Naphtol β (solid).
Nitrites in solution (acid).
Sodium Bicarbonate.
Sodium Salicylate (solid).
Tinctures containing Tannin, Iron, or Quinine.
Rose, Infusion.
Uva Ursi, Infusion.

Antipyrin and Phenyl-urethan liquefy when rubbed together.

Unofficial Preparations and Derivatives.

Salipyrin, *Antipyrin Salicylate*,—is formed by combining Salicylic Acid 57.7, and Antipyrin 42.3 parts; and is the only salt of the base which has any therapeutic importance. Described under SALIX.

Hypnal,—is a combination of Antipyrin and Chloral, heated together, which is credited with hypnotic and analgesic power. It is described under CHLORAL.

Migranin,—is a double Citrate of Antipyrin and Caffein, lately brought forward in Germany as a specific for sick headache and neuralgia. A report is published that the police authorities of Hamburg have issued a notice forbidding its free sale in the local pharmacies, and warning the public against using it except under a physician's direction (Squibb). The dose is placed at about gr. xv.

Phenopyrin,—is prepared from equal parts of crystalline Phenol and Antipyrin. It is an oily liquid, colorless and odorless, insoluble in cold and sparingly soluble in hot water. It has as yet no medicinal importance.

Pyramidon, *Dimethyl-amido-antipyrin*,—is a derivative of Antipyrin by a substitution process, and is highly praised as an antipyretic and analgesic. It occurs as a yellowish-white, crystalline powder, soluble in 10 parts of water. Its applications are the same as those of Antipyrin, but it is less soluble, slower in action, more lasting in effect, and the same results may be produced by it with about one-third the dose. Dose, gr. iv–viij, thrice daily.

PHYSIOLOGICAL ACTION.

Antipyrin is a powerful antipyretic, a local anesthetic, and a general analgesic, also possessing diaphoretic, mydriatic, antiseptic, disinfectant, hemostatic and slight hypnotic powers. After the ingestion of a full medicinal dose (gr. xx), there is a stimulant stage of short duration, in which the heart's action is increased, and a subjective sense of heat is experienced, with flushing of the face. This is soon followed by profuse sweating, coldness of the surface, slowed pulse, considerable depression, and if fever be present by *lowered temperature;* the latter coming on within half an hour after taking the drug and its degree being in direct ratio to the quantity administered, as also its continuance,—the former being usually from 3 to 5 degrees, and the latter from 1 to 10 hours, a fair average being about 2 hours. In one case a fall of 12° F. was observed. When given with Kairin, the mixture of the two drugs has been found to produce a much greater fall of temperature, with longer continuance down, than that produced by an equal quantity of either drug given alone. After the antipyretic effect of the dose has passed off, the temperature (in fever) commences to rise again,—the onset being usually preceded by a chill, which is of slight degree when compared with the severe rigors and dangerous depression occurring under the action of Kairin, Chinolin and other members of the group.

In health the administration of a full dose gives rise to slight nausea, singing in the ears, and a reduction of the body-temperature of scarcely any extent, about $\frac{1}{10}$° F. It slightly raises the arterial tension and blood-pressure; sometimes induces vomiting, and may cause such a degree of depression as to almost amount to collapse. It has little or no effect upon the respiration, but acts as a sedative upon the cerebrum, leaving behind a somewhat depressant influence on the brain. It dilates the pupils and is rapidly eliminated by the kidneys, appearing in the urine within half an hour after its ingestion. The profuse sweating which it causes may be prevented by giving in advance a small dose of Atropine or Agaricine. In some persons a single dose of ten grains produces an urticarial eruption on the skin, and this is occasionally accompanied by swelling and irritation of the mucous membrane of the respiratory tract, the subject feeling as if the nose and throat were swollen so that breathing became difficult.

In toxic dose Antipyrin probably acts as a primary stimulant and a secondary depressant of the spinal cord, paralyzes both the motor and sensory nerve trunks, decreases the arterial pressure, and exerts a poisonous influence on the blood, altering the shape of the red corpuscles, separating the hematin, and causing decomposition of that tissue. A peculiar livid discoloration of the surface is one of the most characteristic symptoms of antipyrin poisoning, and is probably due to the formation in the blood of methemoglobin or some similar compound.

As an antipyretic, Antipyrin, like Alcohol, acts by a double mode of operation,—(1) by diminishing oxidation, and (2) by promoting heat-loss. The latter is attained by dilating the cutaneous vessels, allowing free radiation from the surface, and by the refrigerant action due to evaporation of the sweat.

As an analgesic, Antipyrin has a very considerable degree of power, in common with all the Chinolin derivatives; but its property in this respect is found to act almost entirely upon pain due to manifestations of the rheumatic diathesis. In general anodyne action, it is not to be compared with the derivatives of Opium. Its hemostatic power is claimed to be superior to that of Ergotin.

THERAPEUTICS.

One of the most popular of the modern antipyretics, Antipyrin deserves high rank in professional esteem, being an excellent analgesic and one of the most certain and most powerful depressants of temperature, though somewhat dangerous, and devoid of any other influence upon the course of any febrile disorder. Its principal applications are as follows: (1) *As an antipyretic* it has been employed in all diseases with high temperature, and it may be used in asthenic fevers, as it has little effect upon the circulation. It has held a high place for several years in the treatment of acute rheumatism, and affords valuable aid in the pyrexia of intermittent fever, a stage in which the slow action of quinine prevents that drug being available for immediate relief. (2) *As an analgesic* it is highly efficient except when the pain is dependent upon a local inflammation, in which case it is of no value for this purpose. It is often remarkably effi-

cient in migraine and other headaches, in the fulgurant pains or the p
crises of locomotor ataxia, and in other paroxysms of suffering depen
on disease of the nerve centres, or having the character of nerve storms
is very serviceable in neuralgia, neuritis and other painful affections, e
cially when of rheumatic origin, as lumbago, sciatica, hemicrania, su
orbital neuralgia, etc., in which ten-grain doses are generally suffic
and may be given hypodermically. It often relieves dysmenorrhea,
the painful affections of hysteria, pain from cerebral tumors, and that
to cardiac disease. In acute gout, a preliminary dose of 25 grains,
lowed by 10-grain doses every two hours, promptly relieved the pain
shortened the duration of the paroxysms in one very carefully obse
and thoroughly reported case. In chronic gout, very remarkable re
are reported as due to it, indicating a specific and curative influence
that disease. For the relief of pain, the conjoint administration of A
pyrin and Morphine is said to be much more efficient than the use
either agent alone. (3) *To allay nervous irritation;*—thus it has
used with extraordinary success in nervous urticaria, and is often emplo
with benefit in the restlessness of hysterical subjects. In the urtica
like eruptions of children its action has been so promptly efficient a
indicate for it a direct influence upon the vascular nerves; and
symptomatic remedy against itching it is equally efficient in ner
pruritus, true prurigo, urticaria, erythema, pemphigus vulgaris and lic
ruber. (4) *To antagonize excitability of the motor nerve centres,* a
laryngismus stridulus, whooping-cough, tetanus, epilepsy and chorea.
the latter disease Antipyrin is held in high esteem as a curative rem
and although it often fails entirely in epilepsy, it sometimes acts the
with extraordinary power, especially when given in combination
ammonium bromide. (5) *To affect secretion,* as in infantile diarrhea
which it has rendered signal service, administered in doses of ½ to
grain; and as an antigalactagogue, when it is desired to arrest the se
tion of milk, doses of gr. iv every two hours will prove efficient. It
also been employed with benefit in both forms of diabetes, and has
found to be remarkably effective in promoting the absorption of pleu
effusions. (6) *As a local anesthetic* it is equal if not superior to coca
if applied to the mucous membranes in a 30 to 50 per cent. solu
(St. Hilaire). (7) *As a local hemostatic,* it is highly efficient in 15
cent. solution as a spray for epistaxis, and hemorrhages of almost any
are checked by the application of stronger solutions. It has the adv
tage of constricting the small vessels without causing any external
which may break down. (8) *As an antiseptic* it possesses prope
which compare favorably with most of the anilin and coal-tar derivati

Antipyrin has rendered good service in bronchial asthma, in sea-s
ness, in cerebro-spinal meningitis, and in croupous pneumonia. In

latter affection it has been employed in combination with camphor and small doses of morphine with excellent results. In erysipelas it is thought to be contraindicated, as when administered in that disease it has usually caused anuria and a profound fall of temperature (Spanoudis).

ANTITOXINS (Unofficial). The remarkable reports which have been published during the last few years upon the antitoxin treatment of diphtheria and tetanus have excited fresh interest in bacterio-therapy, and seem likely to dispel the cloud which has rested thereon ever since the failure of Koch's tuberculin. After the discovery of the bacillus tuberculosis in 1882 several other micro-organisms were found to be constantly associated with certain acute infectious diseases, notably tetanus, diphtheria, cholera, pneumonia, erysipelas and typhoid fever. The specific microbes of these affections were at first believed to be the immediate cause of their respective disorders, but later researches have shown that such diseases are due to the action of chemical poisons (toxins and toxalbumins) produced by their specific bacteria growing on suitable soils either within the animal organism or outside it. [Compare the article entitled TOXINS.]

It was shown by Von Fodor in 1887 and subsequently by Nuttall that the blood serum of healthy animals is naturally bactericidal, that it possesses this quality in varying degrees of efficiency, and that it may be sufficiently powerful in this respect to prevent certain pathogenic bacteria from gaining lodgment on the organism, thereby conferring *natural immunity* against a particular disease upon the individual so protected, and in some cases even upon the species. Further study and experiment established the fact that temporary *artificial immunity* against certain diseases may be imparted to an individual animal naturally susceptible by repeated inoculations of the specific bacteria or their toxic products in gradually increasing degrees of virulence (Behring, Kitasato, Roux). The crowning discovery that the blood serum of such an immunized animal may be successfully employed for curative as well as prophylactic purposes against its particular disease upon other animals of the same or different species, was made by Professor Emil Behring of Berlin, in 1891. This was no chance discovery, but was the legitimate result of logical reasoning and hard work, and is formulated under the title *Behring's Law*, as follows: *That the blood serum of an animal which has been artificially rendered immune against a certain infectious disease, when injected into the body of another animal, has power to protect the latter individual against the same disease and to cure the disease after infection has occurred.*

An Antitoxic Serum or **Antitoxin** is a blood serum possessed of these immunizing and curative properties. The term *Antitoxin* is also applied, and more correctly, to the suppositious defensive proteids, which are chemical substances assumed to be contained in the antitoxin serum, and believed to be produced by the blood or tissue cells for the defence of the organism against the foreign bacterial toxins. *Alexins* are similar substances, natural antitoxins, which are supposed to exist in the blood of naturally immune animals.

Ehrlich has shown that Behring's law is valid also for the chemical poisons, *Ricin* and *Abrin*, the respective toxalbumins of the ricinus palm and the jequirity bean. The blood of animals slowly immunized by increasing doses of these toxins contains antitoxic substances named *Antiricin* and *Antiabrin*, which, if added to their respective poisons, will attenuate and even neutralize the latter. These facts are advanced as proof that the slowly increasing artificial immunity is not a simple tolerance acquired by the organism, as Sternberg taught, but is due to the production of new antagonistic and defensive substances by the living cells of the organism.

Theories deduced from the observed facts are as follows: (1) That, as the various pathogenic bacteria produce the causative toxins of their respective diseases, so the organic cells of the body, reacting under the stimulus of the poisons thus introduced, immediately proceed to elaborate defensive antitoxins, which if produced in sufficient quantity will neutralize the effects of the toxins. (2) That residual antitoxins remaining in the blood after recovery render the animal immune for a time against the disease. (3) That the immunizing and curative effects obtained by the injection of the blood serum of an immunized animal into the circulation of another animal are due—either to direct chemical neutralization of the toxins themselves by the antitoxins so introduced (Behring, Kitasato), or to a particular influence exerted by the antitoxins upon the living cells of the organism, which, being affected in two opposite directions, remain neutral to the disease (Buchner).

Specific action is a characteristic of the antitoxins with perhaps a few exceptions; which means that the serum from an animal inoculated with the toxin of the diphtheria bacillus is effective only against diphtheria, and the tetanus antitoxin only against tetanus. A dose of an antitoxin followed by a dose of the corresponding toxin produces no effect from either, the action of the one being rendered ineffective by that of the other. The corresponding toxin and antitoxin may be mixed together outside the body and then injected with like result, though of course there must be a certain amount of antitoxin present to counteract a given dose of toxin. The immunizing or vaccine property of the antitoxins, though transient, is probably destined to be of considerable importance. Instances are already recorded in which epidemics of diphtheria in schools were apparently stopped by vaccinating all the children therein with diphtheria antitoxin.

An Antitoxic Serum is prepared as follows. Either a highly virulent culture of the specific micro-organism of the particular disease, or still better, a strong toxin of tested strength prepared therefrom, is injected into the cellular tissue of a suitable animal, generally a horse, at first in very small quantity. The effect is soon shown by the onset of fever and other symptoms of acute disease, which are known as the "reaction." After an interval of time sufficient for recovery from these symptoms, the injection is repeated with a stronger toxin or with a culture of greater virulence, or with a larger quantity of the original toxin. With proper care the amount injected may be gradually increased, until ultimately a dose many hundred times greater than one which would have been fatal at first can be given with impunity. This process is continued for several months, or until the animal no longer "reacts" to the poison, and then sufficient antitoxin is presumed to exist in its blood to render it immune to the toxin and to the disease. After each inoculation the animal's blood serum is tested as to its value by experiment on guinea-pigs of definite weights. When the desired degree of immunity is reached the animal is bled from the jugular vein under strict aseptic conditions, from 6 to 12 pints being taken from a horse, according to his size and general condition. The blood is received in sterilized flasks, which are carefully stoppered and stored on ice until the clot has separated from the serum. The latter is tested to determine its value in antitoxin, has carbolic acid added to it in the proportion of 0.5 per cent., and is bottled in vials which contain in each the dose for one patient. The vials are labeled with a statement of the number of normal antitoxin units per cc. of the contents, expressed in multiples of a standard normal serum. The effective antitoxin value of a serum intended for protective purposes is much less than that of one intended for curative action, and the earlier in the course of the disease that the latter serum is employed the smaller will be the quantity capable of producing a certain remedial effect.

Serum-therapy properly means the prophylactic and curative treatment of certain acute infectious diseases by the subcutaneous injection of a blood serum containing an antitoxin specific to the particular disease. As generally used, however, this term includes the treatment of the same disorders by the toxins produced by attenuated cultures of their respective microbes; but these toxins, though sometimes grown on blood serum, may be cultivated on other media, and are never administered in a serum as the antitoxins invariably are. The antitoxins at present employed in serum-therapy are those of diphtheria, tetanus, tuberculosis, erysipelas, pneumonia, cholera, syphilis, plague, and typhoid fever, but only the first three have come into anything like general use. Toxin treatment is described under the title TOXINS.

Diphtheria Antitoxin, though not the first antitoxin discovered, is by far the first in practical importance. The bacillus of diphtheria was discovered by Loeffler and Klebs in 1884, its toxic products were isolated by Roux, and the antidote to them was found by Behring, who established the preventive and curative properties of this antitoxin. In the meantime Sidney Martin had proved the chemical identity of the laboratory toxins discovered by Roux with those produced in the body by the bacillus. The clinical results obtained in Paris by the use of Behring's diphtheria antitoxic serum were announced by Roux at the Buda-Pesth Congress of Hygiene in 1894, and attracted universal attention. Since then the statistics of diphtheria serum-therapy have grown voluminous, have included a large number of reports from official and private sources of the highest professional authority, and the weight of evidence has steadily grown more and more favorable to this treatment.

The statistics first presented by Roux covered 300 cases of true diphtheria, treated the Hôpital des Enfants Malades in Paris, with a mortality under the serum treatmer of 26 per cent., against a mortality of 51.7 per cent. in the same hospital during th previous four years in 3971 cases, and a mortality of 60 per cent. in 520 cases during th six months immediately preceding. Professor Virchow stated, at a *fête* of the Empres Frederick Hospital in Berlin, that from April to November, 1895, out of 335 diphther cases treated therein with the serum 305 were cured; and that the diphtheria mortalit in that hospital, formerly 43 per cent., had declined to 9½ per cent. under the antitoxi treatment. Professor Welch of Baltimore has collected and analyzed the statistics avai able in July, 1895, covering 7,166 cases from 80 different sources, and showing a ger eral mortality under the antitoxin treatment of 17.3 per cent., against a previous gener mortality of 42 per cent. Tabulating the results according to the time at which the trea ment was commenced, he shows for 814 cases treated on the first and second days of th disease a mortality of 5½ per cent.; for 531 cases treated on the third and fourth day 15.2 per cent., and for 286 cases treated after the fourth day 31.8 per cent. A collectiv investigation of 5794 cases treated with antitoxin in private houses, made by the Amer can Pediatric Society in 1896, showed a mortality for the whole of 12.3 per cent.; ex cluding moribund cases and those which died within 24 hours after injection, a mortalit of 8.8 per cent.; for those treated within the first three days of the disease, a mortalit of 7.3 per cent.; and excluding the moribund cases from the latter, a mortality of 4. per cent. in 4013 cases.

The clinical history of the disease under the antitoxin treatment, a recorded by its observers, is equally favorable and shows an extraordinar decrease in the severity of the symptoms. The membrane loosens an clears off rapidly, high temperature is lowered, and the pulse slows an gains in force (Washbourn). Evident signs of distress vanished withi 24 hours, and apparent strength and good-humor took the place of a pre viously low mental and physical condition (Kossel). In no case did th larynx become involved after the use of the serum if not so previously and many cases showing laryngeal symptoms recovered without tracheot omy. Even in the fatal cases life was prolonged (Caiger).

While diphtheria antitoxin properly prepared and used under asepti precautions is generally conceded to be harmless, some ill effects ar recorded as caused by it. An urticarial eruption on the skin, also pains i and swellings about the joints, occur in about 5 per cent. of the cases, bu these symptoms are usually transient and without serious consequences Abscess at the site of the injection has occurred, but rarely forms if prope aseptic measures are used. Welch states that in over 100,000 injection given the serious mishaps directly attributable to the serum can be counte on the fingers. Two deaths are reported, one in Berlin and one i Oregon, as having occurred within a few minutes after the injection o the antitoxin in healthy children.

The following seem to be established facts as to the use of antitoxin i diphtheria. The immunized serum is far more efficient as a curative agen than any remedy heretofore employed, the general mortality of the dis ease having been reduced by its use to about 17 per cent. from a previou rate of about 42 per cent. A marked improvement in both the local an general symptoms is usually noticed within 24 to 48 hours after the injec tion of the serum. The remedy has decided power to prevent the spread ing of the false membrane into the larynx and trachea. It is powerless to repair damage already done to the tissues by the diphtheria toxins, hence the earlier the serum is administered the better are its results. It is decidedly more efficient in the fibrinous form of the disease than in the septic form, and in cases of simple infection than in those of double or mixed infection. The liability to paralysis and albuminuria is not lessened but is perhaps somewhat increased by this treatment, though genuine nephritis is less frequently seen under its use than in cases treated by other methods. The serum may cause certain untoward symptoms, as cutaneous swellings, eruptions, etc., but these are not serious and are not attended with danger to life. Its injection is very rarely followed by serious local disturbances, as abscess, and probably would never be complicated thereby if the serum were always pure and used with strict aseptic precautions. Recent improvements in the methods of preparation and more definite knowledge as to the dose and manner of employment have made the later reports even more favorable than the earlier ones. At the 1895 meeting of the British Medical Association, Professor Klein made the statement that "the scientific basis for the application of antitoxic serum is as firmly founded and as thoroughly established as the use and application of any known drug."

Local antiseptic treatment of the throat is still insisted on in connection with the serum injection in every case of the disease. If thoroughly carried out in the incipiency it may destroy the dangerous streptococci and other microbes, thereby preventing the mixed infection which proves so virulent; if continued throughout the case and during convalescence it will minimize the danger of infecting other persons. In some instances bacilli were found as long as two months after recovery.

Behring's Diphtheria Antitoxin is standardized in comparison with a "normal therapeutic serum" of which one-tenth of a gramme will neutralize one gramme of diphtheria toxin, and 1 cc. of which is termed equivalent to one "normal" or "immunizing unit." As distributed the serum contains at least 100 such normal units in each cc., the label on every vial showing the potential strength of its contents, thus: "This phial contains 6 cc. of 100 times normal strength = 600 normal units." Four different potentials are furnished,—one with a yellow label, possessing 200 units, and intended only for prophylaxis, and three for therapeutic employment, viz.: (1) that with a *green* label, counting 600 units, for use only in fresh cases on the first or second day; (2) that with a *white* label, possessing 1,000 units, to be used in more serious cases on the first or second day, or in less serious cases of longer standing; (3) that with a *red* label, possessing 1,500 units, and meant for adults or for very severe cases in children.

A Concentrated Serum is recommended by the committee of the American Pediatric Society, in order to obtain the requisite number of antitoxic units in as small a bulk as possible. Parke, Davis & Co. furnish high-potency serums in hermetically-sealed glass bulbs, containing as many as 1,750 units per cc. These very concentrated preparations are not so stable as those of lower potency and must be used while fresh, as they rapidly lose their antitoxic value.

The Dose for Prophylaxis is 500 units, to be repeated after two or three weeks if the case is still exposed to infection. The immunity is only temporary, its duration depends on the quantity of antitoxin injected, and it gradually decreases as the latter is eliminated, but can be maintained for a long time by the repeated use of smaller doses at short intervals.

The Dose for Curative Purposes should be rather large than small, in order to guard against a virulent infection, 500 units for a light or suspected case, 1,000 to 1,500 for a severe or advanced one; to be repeated on the next or even on the same day if the case seems grave, until 2,000 or even 3,000 units have been given. The maximum quantity decided on may be administered in one dose, and then will not usually require to be repeated. The necessary amount for any case can be determined only by comparative estimation of the quantity of toxin present as indicated by the symptoms; remembering that this quantity increases rapidly with every day after infection. The prognosis is unfavorable if the case is so far advanced before treatment that the toxin has had time to accumulate and to exert its paralyzing influence on the nervous apparatus of the heart.

Diphtheria Antitoxin is now prepared in all European countries and in the laboratories of several boards of health, manufacturing druggists and others in this country. The serum on the English market differs somewhat in strength, Aronson's being a highly concentrated form obtained by precipitating the greater part of the inert constituents, while Klein's is prepared by injecting both the toxins and the bacilli into the animal to be immunized. In Germany the preparation of the serum is conducted by a private firm under the supervision of Professors Behring and Ehrlich, and is tested by official experts before its distribution is permitted by the government authorities entrusted with the control of its manufacture. In this country the favorite serums are Parke, Davis & Co.'s, Mulford's, and that furnished by the New York Board of Health.

Double Diphtheria Antitoxin is a serum obtained from a horse which has been immunized against streptococcus virus after having been previously rendered immune against the diphtheria bacillus. It is supposed to contain both the diphtheria and streptococcus antitoxins, and is intended for the virulent cases due to a mixed infection with these two poisons, but it may be used in any case of diphtheria.

Tetanus Antitoxin. Tetanus was one of the first diseases to be studied successfully by the bacteriologists, and its antitoxin was the first one prepared. Breiger (1880) showed that a crystalline substance of high toxicity could be obtained from tetanic fluids, and that it would reproduce the symptoms of tetanus when injected into healthy animals. Rosenbach found the tetanus bacillus in human cases of the disease, and Nicolaier demonstrated its existence in soils. Kitasato soon afterwards obtained pure cultures of the bacillus, and demonstrated the immunizing power of the serum of animals inoculated with its toxin. As human tetanus is a comparatively infrequent disease there are but few available statistics of its treatment with antitoxin serum, but its previous mortality, as shown by the two largest sets of statistics, covering 2,789 cases, was 88 per cent., which has been reduced to 20 per cent. under the serum treatment (Kreiger). Dr. Marson has reported a series of 38 cases so treated by various physicians, with 25 recoveries, a mortality of 34.2 per cent. Kanthack quotes the total statistics of treatment as giving 68 cases with 26 deaths, a mortality of 38.2 per cent.

In spite of its failure in many instances, the antitoxic serum is unquestionably the most efficient remedy known for this disease. As tetanus is recognizable only by symptoms due to nerve lesions, which symptoms are not manifested until the nervous system has been damaged by the toxin, an early diagnosis is impossible; and when first seen by the physician the disease has usually advanced too far for the curative action of the remedy to be available. For this reason, and as the immunizing properties of this antitoxin are very potent, it is advised that a preventive inoculation thereof should be given in all cases where infection is possible, such as lacerated wounds soiled with earth or rust, especially when occurring in those tropical countries where the disease is most common. For this purpose a dose of 10 cc. would suffice, if repeated at intervals of two or three weeks. For curative purposes the serum should be injected as soon as possible, the quantity being determined according to its stated strength, the gravity of the symptoms, the patient's age and the time since infection. The shorter the time of incubation or the more serious the symptoms, the larger should be the initial dose. As a rule one injection should be given every other day, using a smaller quantity at each repetition, so as to maintain sufficient immunity and prevent relapse. Along with the serum treatment the usual remedial measures should be employed, namely: excision of the part or the actual cautery if the wound is recent, chloroform anesthesia, chloral, etc. The actual cautery, or the application of a strong solution of corrosive sublimate with tartaric acid, are the most efficacious means of neutralizing the tetanus germs in the wound.

Tetanus Antitoxin prepared at the New York Pasteur Institute is dispensed in dry form only, may be transported any distance without injury by heat or frost, and is said to preserve its qualities for an indefinite time if kept in a dark and dry place. It represents as many antitoxic units as are contained in about 12 times the weight of liquid serum. The powder is put up in 25 cc. bottles, each containing 3 grammes, to be filled with sterilized water when required for use, and shaken thoroughly until the powder is dissolved. Each bottle then contains two doses of antitoxic solution, and this amount is to be administered daily for four or five days, beginning on the very first appearance of symptoms of the disease. For prophylactic use 1 to 2 cc. of the solution should be injected immediately after the infliction of a suspicious wound.

Tuberculosis Antitoxin has superseded Koch's tuberculin, which was a toxin treatment, in the serum-therapy of tuberculous disease. Boinet immunized goats with injections of tuberculin, and claims to have used the resulting serum in eight cases of tuberculosis with marked benefit. Professor Maragliano, of Genoa, has treated a large number of cases with serum obtained in a similar manner from the dog, the ass and the horse. His published statistics cover 445 cases observed in his own practice and in that of his colleagues and other practitioners. He concludes that cases of unmixed infection, with circumscribed foci of disease, slight surrounding consolidation, and but little fever, are distinctly benefited by the treatment and some are even cured thereby; but that those with much broncho-pneumonic consolidation or with cavities do not show any great improvement. The local signs of the disease disappeared in 27 per cent. of the cases, the weight increased in 57 per cent., and the bacilli disappeared in 43 per cent.

Dr. Maragliano administers in apyretic cases or those with slight fever 1 cc. of the serum every second day for the first ten days, then a similar dose every day for another ten days, then two similar injections daily for the next ten days. If there is high fever 10 cc. should be given at once, and after three days a daily injection of 1 to 2 cc. if the fever does not rise again, but if it persists a second dose of 10 cc. is given eight days after the first one. Improvement is noticeable often within two weeks but sometimes not until after two months have elapsed. Even when a cure seems complete the injections should be continued for at least a month and even for a year. General hygienic measures must not be neglected, and the efficiency of the digestion must be especially attended to.

Dr. Paul Paquin of St. Louis reported in 1895 upon 22 serious cases of this disease, treated by him in the city hospital with a serum obtained from horses immunized by injection of the toxins of the bacillus tuberculosis. He stated that a large percentage of these cases increased in weight from 5 to 16 pounds each during 6 to 8 weeks, and at the same time showed other evidences of general improvement without the use of tonics or any special diet, only the regular fare of the city hospital or poor-house being available for them. After the lapse of six months the entire 22 were alive, all having improved and more than one-half the number having been discharged from the hospital as well enough to work. In 1897 Dr. Paquin read a report before the American Medical Association in which he dealt with the results obtained in 393 cases of tuberculous disease, and claimed 93 complete recoveries, or 23⅔ per cent. of all the cases. Numerous reports from other observers testify to good results obtained with Paquin's serum in the worst cases, *e. g.*, knee-joint tuberculosis (Cale), laryngeal tuberculosis (Loeb), and acute pulmonary tuberculosis (Lemen). The effects observed after injecting Paquin's serum include erythema, urticaria, local swellings, pain, swelling and stiffness of joints, numbness, pain in the spine, in the head and in the stomach. The most serious complication is a sudden disturbance of the circulation, caused by the injection entering a vein or the muscular tissues, which requires the prompt administration of cardiac stimulants, as alcohol, nitroglycerin, etc.

Paquin administers a beginning dose of 10 minims, with strict aseptic precautions, hypodermatically into the subcutaneous tissue of the back, avoiding vessels and muscular tissue. He repeats the injection once daily, increasing the dose by 5 minims so long as it does not raise the temperature more than 1° F. above the normal. A dose of 25 minims is usually sufficient as a maximum. He advocates the use at the same time of a continuously acting vaporizer containing creosote and other antiseptics; also the inhalation of the vapor of the essential oils of peppermint, eucalyptus and cinnamon from a "lip-trough inhaler" worn under the nose, and repeated disinfection of the mouth and throat by an antiseptic gargle. He stated that a fever rising above 101° F. usually indicates a mixed infection, in which the serum treatment is not indicated; the cases amenable to it being the incipient ones and those in the first and second stages of the disease.

Dr. Carl Fisch of St. Louis immunizes selected horses by injections of Koch's new tuberculin. (See under the title TOXINS). The injections are given in gradually increasing quantity, during a period of four months, until the enormous dose of 50 cc. of tuberculin-R is reached. The resulting serum is claimed to be "a really antitoxic and bactericidal antiphthisic serum," by which "it is possible to immunize and cure guinea-pigs with perfect certainty." This preparation is named *Antiphthisic Serum T. R.*, and is put up in vials containing 10 cc. each by John F. Milliken & Co. of St. Louis. It has been used in some 20 cases of human tuberculosis with results which are stated to be "exceedingly gratifying."

Niemann has obtained good results in the treatment of tuberculosis of moderate severity with a serum obtained from young goats inoculated with increasing doses of a tuberculin prepared from a virulent culture of tubercle bacilli. The general condition of the patients showed marked improvement, the tubercle bacilli disappeared from the sputum, and the cough and expectoration considerably diminished. High elevation of the temperature rarely followed the injection of the serum, even in large doses, while albuminuria was never observed.

Lemen has treated 31 cases of pulmonary tuberculosis with various serums, including Paquin's and Fisch's. He reports 8 apparent recoveries, of which 6 were in the first stage of the disease and 3 in the second. Of those in the third stage, that of cavity-formation, numbering 15, all died.

Streptococcus Antitoxin has been employed successfully in erysipelas, puerperal fever, and several forms of septicemia and pyemia due to streptococcus infection. The credit for the suggestion and preparation of this antitoxin is due to Dr. Marmorek, of the Pasteur Institute, Paris, who has treated therewith 411 cases of erysipelas with a mortality of 3.4 per cent. He also treated 16 cases of puerperal fever with this serum; seven of which, due to streptococcus infection, recovered; one, due to bacterium coli, died; and among eight of mixed infection with streptococcus, bacterium coli and staphylococcus, five died. Though puerperal infection may be set up by several other organisms, in the majority of cases it is due to the streptococcus pyogenes, and in such cases only will this serum be successful. Furthermore, as strepto-infection is at first essentially a local disease and later becomes a blood disorder, local treatment should be carried on from the commencement and in conjunction with the serum treatment. Several cases of puerperal fever, erysipelas and other forms of streptococcus infection, are reported by Pozzi, Charrin, Roger, and others, as having been treated successfully with this antitoxin, including 14 severe cases of puerperal septicemia with only 2 deaths (Williams). It has been used with benefit in scarlet fever (Josias), in phlegmon following infection during operations (Van

Schaick), and in acute hemorrhagic septicemia resulting from a wound received while making an autopsy on a case of suppurative peritonitis (Ballance). The treatment is not entirely free from risk, several French observers having reported deaths which were apparently due to the serum (Hirst). Many of the most virulent cases of diphtheria are due to a double infection with the diphtheria bacillus and the streptococcus, and for the treatment of such a combination antitoxin has been prepared by Marmorek and also by Gibier. (See under DIPHTHERIA ANTITOXIN, *ante* page 179.) The treatment of sarcoma and carcinoma by injections of streptococcus antitoxin is noticed under the title TOXINS, and the subtitle ERYSIPELAS AND PRODIGIOSUS TOXINS.

Streptococcus Antitoxin is obtained from the horse immunized against streptococcus erysipelatis by inoculations with the toxins of cultures which have been rendered highly virulent by passage through a certain series of animals. The serum possesses great activity, and is dispensed in vials containing a quantity sufficient for four injections of 6 cc. each, two of which may be given immediately and two on the following day.

Syphilis Antitoxin.—A serum obtained from the blood of lambs and dogs has been used by Tommasoli and other Italian experimenters in the secondary and tertiary manifestations of syphilis, with encouraging results. It has been suggested that the natural insusceptibility shown by certain animals to this disease may be increased by injecting into them the blood serum from human subjects in the primary or active secondary stages of syphilis. This has been carried out by Triboulet and others, without prejudicial effect on the animals injected, and their serum was used in the treatment of extensive tertiary ulcerations, with the result that these lesions almost completely disappeared, although they had resisted a six months' course of the ordinary treatment. Hericourt records a striking improvement in a case of syphilitic tabes under the same method, and other similar observations have been reported with equally favorable results. The doses employed were 2 cc. of the serum on successive or alternate days. The only complications observed were a transitory roseolar eruption, slight albuminuria, and a brief elevation of temperature.

Antivenene is the name given to an antitoxin prepared by Fraser in consequence of Calmette's discovery that the serum of an animal immunized by the injection of increasing doses of serpent venom possesses antidotal and immunizing properties against the effects of the bites of poisonous snakes. The active principle of serpent venom is of albuminous nature and is analogous to the so-called toxalbumins, active ingredients of the bacterial toxins. Antivenene does not seem to be specific, as are the antitoxins in general, for Fraser finds that when obtained by the inoculation of cobra-poison it is equally effective against the venom of several serpent species, including the cobra, the rattlesnake, etc. Calmette states that tetanus antitoxin antagonizes the effect of cobra venom to a certain extent, also that intra-venous injections of calcium hypochlorite produce a blood serum which possesses antitoxic properties against the effects of the cobra poison.

Other Antitoxins have been prepared by inoculating the cultures or the toxins of Fränkel's pneumococcus, the typhoid bacillus, and the bacteria of cholera, erysipelas, anthrax, vaccinia and the plague. Even rabies has its so-called antitoxin, though its bacterial origin has never been demonstrated. The blood of lepers and cancer elements have been used as toxins for the inoculation of animals in order to obtain antitoxic serums for use in the treatment of these diseases. The results have so far been few and unimportant. *Typhoid Antitoxin* is obtained by injecting sheep for three months with broth cultures of the typhoid bacillus. The resulting serum is found to be efficient in neutralizing the effects of the typhoid toxins in guinea-pigs, and a few cases of human typhoid have been treated with it, apparently with good results. *Vaccinia Antitoxin* is supposed to exist in the serum of vaccinated heifers, and M. Béclère has treated a few cases of variola with such a serum, in one case using 1,560 cc., with the result that the patient recovered rapidly without suffering any inconvenience. In another case an infant 21 days old received injections of the serum to the amount of $\frac{1}{20}$th of its weight, and was cured of a serious form of small-pox. *Plague Antitoxin* is prepared at the Pasteur Institute and was used by Dr. Yerson at Amoy in 23 cases, with only 2 deaths. As the previous mortality of this disease was about 80 per cent., this result of the serum treatment proves decidedly encouraging.

APIOLUM, Apiol, (Unofficial),—is an oily liquid, of green color, acid reaction and pungent taste, soluble in alcohol, ether, chloroform, and in glacial acetic acid. It is extracted from the fruit of *Petroselinum sativum* (Parsley), a biennial plant of the nat. ord. Umbelliferæ, which also contains a gelatinous substance named *Apiin*, and a *Volatile Oil* which is by some considered to be the true emmenagogue principle of the plant. *Apiol* is probably a mixture of several substances, and as found in commerce is often an impure oleoresin. Dose, ♏iij–x in capsule two or three times a day; as an emmenagogue, ♏xv in one daily dose.

A camphor, also named *Apiol*, $C_{12}H_{14}O_4$, is obtained from the same source, and occurs in white needles, of a feeble parsley odor, insoluble in water, but freely soluble in alcohol or ether. Dose, gr. xv as an antiperiodic, gr. v–x against dysmenorrhea.

In small doses (♏iij–v) Apiol is carminative, diuretic, diaphoretic, expectorant and stimulant to the circulation. In full doses (♏xv) it is decidedly emmenagogue and feebly antiperiodic, but produces headache, tinnitus aurium, intoxication, giddiness, etc., its action generally resembling that of Quinine. Large doses (♏xxx–ʒj) are decidedly narcotic.

Apiol has had some reputation in intermittents and in malarial neuralgiæ, but is most frequently employed in amenorrhea and dysmenorrhea, being of especial advantage in the amenorrhea of anemia, also when the menstrual discharge is fetid. It is becoming fashionable as a supposed abortifacient, but is useless for this purpose, and if freely used may produce decided narcotism, especially if the preparation employed should happen to be an active one. The capsules of Apiol put up in France and sold in this country over the counters of drug-stores to any applicant are generally inert; hence cases of poisoning by this drug are seldom observed. They are, however, an important source of revenue to the retailers, as, being "imported" preparations, they command a high price, which is readily paid by gullible women who wish to "bring around" their "courses."

APOCYNUM, Canadian Hemp,—is the root of *Apocynum cannabinum*, an indigenous perennial plant of the nat. ord. Apocynaceæ, and is inodorous, but of bitter, disagreeable taste. It contains a peculiar active principle, *Apocynin*, also tannic and gallic acids, resin, wax, caoutchouc, etc. Dose of the powdered root, gr. v–xxx. A decoction (℥ss to the pint) may be given in doses of ℥j–ij thrice daily.

Extractum Apocyni Fluidum, *Fluid Extract of Apocynum*,—Dose, ♏v–xxx.

Apocynum is powerfully emetic and cathartic in full doses, also diaphoretic, expectorant and sometimes actively diuretic. It lowers the pulse-rate, produces much nausea, and induces drowsiness. It should not be confounded with the Indian and American Hemps (Cannabis sativa), which have entirely different qualities.

The only condition in which Apocynum has proven of much value is dropsy, especially ascites and the anasarca of Bright's disease, in which 15-grain doses are indicated. The active principle, *Apocynin*, is a good expectorant, in doses of gr. ¼ to gr. ½.

AQUA, Water, H_2O,—is natural water, in its purest attainable state; a colorless limpid liquid, devoid of odor or taste, and of neutral reaction. Besides entering into the composition of most of the official extracts, fluid extracts, and many other pharmaceutical preparations, from it are prepared the 17 official Waters (Aquæ), and also the following:—

Aqua Destillata, *Distilled Water*,—H_2O,—1000 parts of water are distilled, the first 100 parts obtained being thrown away, 800 parts are preserved. It is as near chemically pure water as can be obtained.

Aqua Carbonata, *Carbonated Water, Soda Water*,—is described under ACIDUM CARBONICUM, *ante*, page 91.

Nomenclature of Water.

AQUA FLUVIALIS, River-water.
AQUA PLUVIALIS, Rain-water.
AQUA FONTANA, Spring or Well-water.
AQUA MARINA, Sea-water.
AQUA CARBONATA, Carbonated Water, Soda Water.
AQUA DESTILLATA, Distilled Water.
AQUA BULLIENS, Boiling Water.
AQUA FERVENS, Hot Water.
AQUA COMMUNIS, Common Water.
BALNEUM MARIS, Warm-water Bath.
BALNEUM VAPORIS, Vapor Bath.

MINERAL WATERS.

Natural Water differs from distilled water in containing saline and other constituents in varying proportions,—from common water (Aqua Communis), in which they are so small in quantity as not to alter the taste, color, etc., up to the Sea-water, having 3⅓ per cent., and that of the Dead Sea with 26½ per cent. Spring waters, impregnated with foreign substances so as to have a decided taste and a marked action on the human system, are called *Mineral Waters*, which may be subdivided into various groups, according to their prevailing constituents, as *Carbonated, Alkaline, Saline, Sulphuretted, Silicious*, etc. Full analyses of all the principal mineral waters of Europe and America are given in *Squire's*

Companion to the British Pharmacopœia, also in the 15th edition of the *United States Dispensatory*, but a few of the most prominent will be mentioned here.

Alkaline Mineral Waters.

Ems, Germany.
Salzbrunn, Germany.
Gleickenberg, Austria.
Vichy, France.
Vals, France.
Bladon Spring, Ala.
Congress Spring, Cal.
Seltzer Spring, Cal.
Perry Springs, Ills.
St. Louis Spring, Mich.
Buffalo Lithia Spring, Va.
Hot Spring, Va.
Warm Spring, Va.
Berkeley Spring, Va.
Bethesda Spring, Wis.
Gettysburg Spring, Pa.

These waters are generally cold, those of Vichy and Ems being warm. They contain a considerable amount of Sodium Carbonate, also Sodium Chloride and Sulphate, and various other Chlorides, Carbonates and Sulphates, with Carbonic Acid gas in varying quantity. *Vichy* and *Vals* waters depend for their efficacy almost wholly on the quantity of Sodium Carbonate contained in them, which is for Vichy from 26 to 50 grains and for Vals about 60 grains to the pint.

Saline Mineral Waters.

Friedrichshall, Germany.
Hunyadi Janos, Germany.
Baden-Baden, Germany.
Wiesbaden, Germany.
Carlsbad, Bohemia.
Püllna, Bohemia.
Seidlitz, Bohemia.
Marienbad, Bohemia.
Cheltenham, England.
Kissingen, Bavaria.
Reichenhall, Bavaria.
Adelheidsquelle, Bavaria.
Kreutznach, Prussia.
Saratoga Springs, N. Y.
Ballston, N. Y.
Hot Springs, Arkansas.
St. Catherine's, Ontario, Canada.

These waters are of more complex composition, the various waters of Saratoga containing more than thirty constituent salts. Those usually present are the Sulphates and Carbonates of Sodium, Calcium, Magnesium, etc. (*Magnesian waters*); Chlorides of Sodium, Potassium and Lithium (*Chlorinated waters*); Ferrous salts (*Chalybeate waters*), with Iodine, Bromine, Manganese salts, and Phosphates in some few. Carbonic Acid gas is present in all. Most of them are purgative, some are considered alterative, and many are warm (100°–160°).

The most powerful member of the saline group is *Hunyadi Janos*, which contains about 150 grains each of Magnesium and Sodium Sulphates to the pint, and is, therefore, effectively purgative. Nearly as strong is *Püllna* water, with 124 grains of Sodium Sulphate and 93 grains of Magnesium Sulphate to the pint. *Friedrichshall* is less powerful, but perhaps a better aperient water in doses of 6 to 10 fluid ounces. *Marienbad* contains no Magnesium Sulphate, but has 36 grains of Sodium Sulphate, 9 of Sodium Carbonate, 11 of Sodium Chloride, and a small quantity of Ferrous Carbonate to the pint; in transportation, however, it loses its Carbonic Acid and deposits the Iron. It is not aperient in ordinary doses. *Carlsbad* water contains 20 grains of Sodium Sulphate and 9 each of Sodium Carbonate and Chloride to the pint. The so-called "Carlsbad Salt" is simply Sodium Sulphate with a trace of the Carbonate. Hartnack gives the following formula for its artificial preparation: Sodium Sulphate 100 parts, Sodium Bicarb. 80, Sodium Chloride 40; a dessertspoonful in water as a mild saline purgative. These waters are imported into, and made in the United States in large quantities, and may be ordered through any druggist.

Sulphurous Mineral Waters.

Aix-la-Chapelle, Prussia.
Barèges, S. France.
Eaux-Bonnes, S. France.
Llandrindrod, Wales.
Harrowgate, England.
Blue Lick Spring, Ky.
Sharon Spring, N. Y.
Yellow Sulphur Spring, Va.
White Sulphur Spring, W. Va.
Salt Lake Warm Springs, Utah.

These waters all contain Sulphuretted Hydrogen gas, also Carbonic Acid gas and Carbonates, Chlorides and Sulphates of Sodium, Potassium, Magnesium and Calcium; sometimes Carbonate and Oxide of Iron, Iodide and Bromide of Sodium.

Carbonated Mineral Waters.

These waters are cold, contain generally Carbonates of Calcium, Magnesium and Sodium (in some, Iron), which are held in solution by the excess of Carbonic Acid, also Chlorides of Sodium and Potassium, Sulphates, Phosphates, etc. They are described under ACIDUM CARBONICUM, *ante*, page 91.

Silicious Mineral Waters.

Hot Springs, Iceland.	Geysers of Yellowstone Park.

The constituents of these waters are chiefly alkaline Silicates.

PHYSIOLOGICAL ACTION OF WATER.

Water is an essential constituent of all the tissues of the body, forming from 0.2 per cent. of the enamel of the teeth to 77 per cent. of the ligaments. In the liquids of the organism it is contained in the proportions of 78 per cent. of the blood to 93 of the urine, and 99 of the tears. In moderate quantity it is necessary to digestion, but in large amount it weakens digestion by diluting the gastric juice. Ice-cold water, if freely used, suspends the action of pepsin, depresses the nerves of the stomach, and lowers its blood supply. The free use of water internally produces increased cutaneous and renal excretion, and promotes the elimination of some of the products of tissue-change, as urea, phosphoric acid, etc. In some subjects it favors the deposition of fat.

Cold water applied externally, as by a bath (40°–60° F.), abstracts a portion of the body-heat, lowering the surface temperature and depressing the cutaneous nerves, producing spasmodic breathing and a quickened pulse. If the temperature of the water is not too low and the bodily vigor is good, reaction soon occurs, and the general effect is tonic to the muscular power, to the circulation and the respiration. If this does not take place a secondary chill occurs, and serious depression may result.

Warm water (95°–100° F.) applied to the surface of the body, as by baths of water or steam, packing, etc., acts in the opposite manner at first, increasing the circulation in the skin, the rapidity of the pulse and respiration and the body-temperature. Rapid tissue-change occurs, the waste products being eliminated chiefly by the skin and the pulmonary mucous membrane. If long continued, precordial oppression, giddiness and muscular debility are experienced.

Hot water (110°–112° F.) at first dilates the vessels of the part to which it is applied, and soon afterwards contracts them. It is a valuable means of relieving congestion and inflammation, and is a most effective hemostatic when the bleeding is from small vessels or of capillary character. Whether generally or locally applied it is one of the most reliable means of relieving spasm. Hot vapor applied to the surface accelerates the circulation and produces profuse sweating. Its general action is similar to that of warm water.

Mineral waters taken internally act chiefly by virtue of the water, partly in accordance with the effects of their various constituents. As baths, their action is doubtless entirely due to their temperature.

Pathogenic Microbes of several diseases, notably those of cholera and typhoid fever, are conveyed to the human system in drinking water contaminated therewith. But these organisms are destroyed by a temperature of 144° F. in the absence of their spores, while a temperature of 212° F., that of boiling water, maintained for five minutes, destroys the spores of all pathogenic organisms which have been tested (Sternberg). This fact is of the highest practical importance, as it shows that no germs of disease need ever gain entrance to our bodies through our drinking water, if only we will boil it. Many years ago an English physician's report was quoted in Braithwaite's Retrospect, in reference to the immunity of the Chinese from typhoid fever, though he said that in Pekin there was no system of sewerage, but that all excreta were thrown on the ground to find their way into the watercourses by which the city was supplied, to soak into wells, etc. Yet, the author said, that contrary to all experience elsewhere, typhoid fever was unknown in Pekin. The reason is to be found in the fact that the Chinese boil all the water they drink. Those who know them best say that they never drink cold water, but always tea, *i. e.*, boiled water. There must be some reason for their remarkable health under adverse hygienic surroundings.

THERAPEUTICS OF WATER.

Cold water (or ice) has many external applications of value in the treatment of disease. As a wet pack it is used in tonsillitis, diphtheria and croup. Cold baths are the most effective antipyretic in the high temperature of fevers, and the cold wet pack is used for the same purpose. Ice or cold water is applied to the head in acute cerebral congestion, and to the spine in chorea, etc.; also locally in hemorrhoids, bubo, orchitis and to the uterus in post-partum hemorrhage. Cold affusion to the body is employed as a preventive of spasmodic croup, as well as to lessen susceptibility to taking cold.

Hot water externally, as fomentations, hot wet packs, baths, etc., is most effective in reducing local congestion and setting up resolution of local inflammation. Hot fomentations to the renal region are useful in functional inactivity of the kidneys. The hot spinal douche is used in affections of the spinal cord and meninges, and in the backache of women. The hot wet pack is highly esteemed in inflammation of the thoracic organs. The vaginal hot water douche is highly valued by gynecologists for many morbid conditions of the uterus and its appendages, especially catarrh of the vaginal and cervical mucous membrane, subinvolution of the uterus, also congestive, swollen and neuralgic conditions of the ovaries, tubes and adjacent tissues. The continuous hot water bath was highly commended in skin diseases by Hebra, who administered it in cases of extensive burns, psoriasis, pemphigus and variola. The continuous immersion in very hot water of an indolent wound, ulcer or sore, is a method of great efficiency for the promotion of the healing process in cases which have resisted the ordinary stimulant applications. Hot water dressings for wounds are strongly favored by many high surgical authorities. Vapor and Turkish baths are used as diaphoretics in advanced kidney disease, in acute and chronic rheumatism, mineral poisoning, and syphilis. Warm baths, with cold applications to the head, are esteemed of value in infantile convulsions and chorea.

Internally, water is chiefly of value as a diuretic, and if hot as a diaphoretic. A glass of cold water before breakfast daily is often an effective means of overcoming constipation, while the drinking of hot water an hour before each meal has been of great value to many dyspeptics. The value of the popular teas in chronic diseases is almost entirely due to the diluent, diuretic and diaphoretic actions of the hot water used.

THERAPEUTICS OF THE MINERAL WATERS.

An undue value is placed by the laity and interested proprietors on the medicinal value of mineral waters, causing the various localities of the best advertised springs to become resorts for invalids and idlers from every civilized country. The benefit derived is in most instances due to the change of climate and scene, freedom from home cares and business worry, regularity of life and diet, drinking of water in quantity, and in many cases the substitution of water for alcoholic beverages. In order to get the worth of their money, people will gladly submit to rigid hygienic and dietetic restrictions at a watering-place which they would totally ignore under treatment at home. The same may be said of the treatment at the so-called "hydropathic" or "water-cure" establishments. As a rule, those springs will prove of most value which are furthest removed from the patient's residence,—for "distance lends enchantment" in these matters as well as in many others. Invalids whose homes are in the vicinity of some wonder-working spring will not usually derive much benefit from its water, but will by that of another spring, similar in constituents, but located several hundred miles away.

The principal affections in which mineral waters are esteemed most highly are the following: dyspepsia, cirrhosis of the liver, gout, rheumatism, lithiasis, diabetes of hepatic origin, constipation, strumous disorders, obesity, plethora of the pelvic organs, hypochondriasis, skin diseases, especially those dependent on gastric derangement, phthisis, constitutional syphilis, metallic poisoning, etc., in all of which the influences above mentioned are especially efficacious, and are no doubt the chief factors in producing any benefit which may be attainable. Aperient and purgative waters are useful in many cases where a prejudice exists against purgative medicine, but none against the same agents in a natural water. The strong saline-aperient waters, as Carlsbad, Hunyadi, Friedrichshall, etc., have considerable repute in the treatment of the uric-acid diathesis and calculous affections, and the waters of St. Catherine's Wells are credited with decided influence upon local and chronic rheumatism.

The special therapeutics of mineral waters are to be found in this volume under the heads of their principal constituents, as Acidum Carbonicum, Sodium Chloride, Sodium Sulphate, Magnesium Sulphate, etc.; also in the therapeutical part of the book.

ARGENTUM, Silver, Ag,—is represented by the following four official salts, viz.:—

Silver Compounds and their Preparations.

Argenti Nitras, *Silver Nitrate,* $AgNO_3$,—occurs in colorless rhombic crystals, of bitter caustic taste and neutral reaction, soluble in 0.6 of water and in 26 of alcohol. Is best given in pill with Kaolin, or in distilled water; never with tannin or a vegetable extract, lest an explosive compound result. Dose, gr. ⅙–½,—if watched, up to gr. j may be given. When melted with 4 per cent. of Hydrochloric Acid, it makes—

Argenti Nitras Fusus, *Moulded Silver Nitrate, Lunar Caustic,*—for local use as a mild caustic and astringent. **Argenti Nitras Dilutus,** *Diluted Silver Nitrate, Mitigated Caustic,*—is the same salt melted with twice its weight of Potassium Nitrate. It is used locally by ophthalmologists.

Argenti Cyanidum, *Silver Cyanide,* AgCN,—has no medicinal use except for the extemporaneous preparation of Hydrocyanic Acid. (See *ante*, p. 99.)

Argenti Iodidum, *Silver Iodide,* AgI,—a greenish yellow powder insoluble in water or alcohol. Is used instead of the nitrate internally, as it is supposed not to discolor the skin. Dose, gr. ¼–j in pill.

Argenti Oxidum, *Silver Oxide,* Ag_2O,—a brownish black powder, nearly insoluble in water and insoluble in alcohol. It is liable to decompose with violence when mixed or triturated with readily oxidizable or combustible substances, as creosote, phenol, potassium permanganate and many others. It should not be brought into contact with ammonia. Dose, gr. ½–ij in pill with Kaolin. It is not a dangerous internal remedy.

All the silver salts should be protected from light in dark blue or amber-colored vials.

PHYSIOLOGICAL ACTION.

Metallic Silver is antiseptic, probably by forming a lactate with the lactic acid produced by microbes. In contact with colonies of germs it kills them without exercising any inimical action on the animal tissues (Credé). Locally the silver salts are antiseptic, astringent, irritant and caustic, according to the strength of the applications. They are less irritant than the salts of mercury and more so than the salts of lead. The soluble salts of silver, taken internally in medicinal doses, are tonics to the nervous system, increase tissue change and promote the secretion of bile; in larger doses they depress the heart, reduce the temperature and impair the respiration; in overdoses they act upon the central nervous system, producing tetanic convulsions or paralysis. In mammals they affect the medullary centres particularly, at first stimulating and then depressing them, causing a primary rise of blood-pressure which afterwards falls, also slowing and embarrassing the respiration, which finally fails from paralysis of the respiratory centre. The heart is but slightly affected and often continues to beat for some time after the breathing has stopped. The mucous membrane of the stomach and intestines shows congestion, ecchymoses and ulceration, the kidneys are irritated and edema of the lungs often occurs. None of these effects have been observed in man, but in him the prolonged use of the silver salts will produce chronic silver poisoning, known as *Argyria*. The first sign of this condition is a slate-colored line along the margin of the gums, with some inflammatory swelling. Subsequently grayish patches appear on various parts of the skin and mucous membranes, and extend over the whole integument which becomes slate-colored. No organ of the body, except the parenchymatous cells and the epidermis, is exempt from this pigmentation, which is due to the deposit of silver, either in the metallic state or as an oxide or some organic compound, in the connective tissues. In the skin it is found in the corium, not in the epidermis. As a rule argyria does not produce any serious effect upon the health of the subject, though some authorities have ascribed to it gastro-intestinal catarrh, faulty assimilation, changes in the blood and fatty degeneration of the heart, liver, and kidneys. It is probable that in most cases some degree of deranged nutrition is produced. A local argyria may be caused by the frequent topical application of a soluble silver salt for a long time. In a few cases general argyria has resulted from the local use of a silver salt, usually in the mouth or throat; and it appears in workers in the manufacture of artificial pearls, who use silver as a pigment. Argyria is incurable, though many attempts have been made to remove the discoloration by the administration of iodides. The only solvent is Potassium Cyanide, which is inadmissible by reason of its violent toxicity.

Silver salts unite with albumin to form albuminates, which are soluble in the digestive fluids, but it is not certain that silver is thus absorbed. According to some authorities the salts are reduced in the stomach and also in the intestinal canal, the tendency of such action being towards the separation of the metal, most of which passes through the alimentary canal unabsorbed, a very small portion finding its way through the lymphatics to the tissues and remaining imbedded therein indefinitely.

The Nitrate is the most soluble of the silver salts. It is antiseptic, astringent, hemostatic, irritant, and a limited escharotic, also antiphlogistic, antispasmodic and tonic. It has a strong affinity for albumin, with which it unites to form an albuminate. Locally applied in dilute solution it causes a marked contraction of the bloodvessels, but in stronger solutions it is irritant, dilating the vessels and acting as a superficial caustic by coagulating the albumin of the tissues to which it is applied and destroying their vitality. A dense layer is thus formed which prevents the further penetration of the salt and so limits its escharotic action. This albuminous coating is at first white but soon turns black under the influence of light. The stains made by handling or applying it to the skin may be removed by washing with a strong solution of Potassium Cyanide, and may in great part be prevented by immediately neutralizing the silver salt with a solution of common salt. Internally, in small doses, the Nitrate stimulates the heart, promotes nutrition and acts as a nerve tonic. In large doses it produces violent gastro-enteritis, corrosion and ulceration of the gastro-intestinal mucous membrane, due to thrombosis of its veins. Burning pain is felt in the throat and stomach, followed by nausea, vomiting and often by purging. Central impairment of the nervous system may occur, with loss of co-ordination power and paralysis. Collapse follows, with weak pulse, pinched face, coldness of the surface and shallow respirations; and this condition may be followed by coma, convulsions and finally death from paralysis of the respiratory centre. The lethal dose has not been determined.

Antagonists and Incompatibles.

Common Salt freely used is the antidote, precipitating the silver as the insoluble chloride and acting as an emetic. The Nitrate is exceedingly sensitive to organic material and to light, which readily decompose it. Incompatibles are Alkalies and their carbonates, Alkaloids, solutions of Arsenic and Tannin, most of the Mineral Acids and their salts, also all Bromides, Chlorides, Iodides, and Phosphates. Distilled Water should be specified when prescribing the Nitrate in aqueous solution. In spite of the most careful choice of an excipient it is doubtful if the Nitrate ever reaches the stomach in its own form, and if it does it is probably changed at once upon arrival.

A course of silver medication should be regulated by suspending the remedy after 5 or 6 weeks' use, then promoting elimination by purgatives, diuretics and baths. To prevent the general discoloration Potassium Iodide may be given conjointly with the silver, and baths of Sodium Hyposulphite used frequently. The dark line at the margin of the gums is removable by a course of the Acid Tartrate of Potassium. Argyria has been produced in three months and after the use of ℥ ss–j of the nitrate.

THERAPEUTICS.

The local uses of Silver Nitrate, which are the most important, depend on its antiseptic, hemostatic, astringent, caustic and stimulant properties. As an antiseptic it has proved an efficient prophylactic against ophthalmia neonatorum, a drop of a 1 per cent. solution being instilled into each eye of the new-born infant. In this disease, when the discharge is purulent, a similar solution should be applied to the conjunctiva daily, and when the discharge is very profuse a 2 per cent. solution is not too strong. A solution of the latter strength is commonly employed in the purulent conjunctivitis of adults, applied once daily to the everted lids by a brush, after cleansing and drying the surface; the excess being removed by washing with warm water or by neutralization with a solution of common salt. When the cornea is intact a solution of ¼ to ⅓ of one per cent. strength may be occasionally dropped into the conjunctival sac, but care must be taken that it does not come in contact with an inflamed or ulcerated cornea, as it is not well borne in such cases and may cause a permanent corneal opacity by the deposit of silver.

In chronic purulent inflammation of the middle ear Silver Nitrate is one of the most valuable applications, in solutions varying from ¼ of one per cent. to saturation, applied by a special syringe through the perforated tympanic membrane or by dropping them into the external meatus. Aural polypi have been successfully treated with solutions of from 6 to 20 per cent. strength. Weak solutions are useful in eczema of the ear and in external otitis, also for chronic inflammation of the lining membrane of the Eustachian tube, to abort aural furuncles and to relieve pruritus of the external auditory meatus.

In the local treatment of the nose and throat Silver Nitrate is useful but should be employed with care. The stick of caustic is brittle and liable to break off while in use, hence it might be swallowed and produce acute poisoning. The danger of general argyria occurring from the prolonged use of the salt in this situation should be remembered. For ulcers on the nasal septum, vascular granulations arising after operations on the nose, fissures of the tongue and lips, and mucous patches and ulcers of the mouth, the fused stick or a moderately strong solution is a good application. In subacute and chronic laryngitis a weak solution is sometimes very effective, as it is also in ulcer of the larynx when not due to laryngeal tuberculosis.

In genito-urinary surgery Silver Nitrate has many uses. In solutions of various strengths, 1 in 2000 to 1 in 500, it is an old remedy for gonorrhea, applied to the urethra during the course of the disease. Stronger solutions, up to 5 per cent., have been employed in the early stage with the view of aborting the inflammation, but this procedure causes great pain and has many opponents as well as many advocates. If it fails to cut the disease short it will probably aggravate the inflammation considerably. The milder solutions are useful applications in chronic gleet, prostatorrhea, urethritis, vaginitis and chronic cystitis. In the form of gelatin bougies impregnated with the salt it may be applied to the urethral mucous membrane with more facility and with better results than by injection with a syringe. A 2 per cent. solution injected into the substance of buboes in their early stage has given satisfaction. Indolent sinuses from buboes or abscesses may be stimulated to healing by the application of lunar caustic lightly or a strong solution of the salt. It has been much used in the treatment of cervical endometritis and erosion of the os uteri.

In diseases of the skin the Nitrate is employed to destroy parasitic fungi, to cause exfoliation of the epidermis and for a stimulant effect upon indolent ulcers and sores. Lunar caustic is used to destroy warts and other small growths, to arrest capillary hemorrhage and for other similar purposes. Solutions of various strengths are useful in some forms of eczema, relieve the itching in prurigo and lichen, and are said to prevent pitting in variola. It is a very efficient application in pemphigus, if used in a 4 per cent. solution to the surface of the derma, after removing the epidermis over the blebs and cleansing their bases of all secretion. Chilblains may be painted with a strong solution to relieve the irritation, and in lupus, psoriasis, erythema and ringworms solutions of this salt have been applied with satisfactory results. In erysipelas a concentrated solution, 20 grains to the drachm, was formerly applied on the inflamed surface and over the healthy skin beyond to the extent of two or three inches, after washing and drying the part, with the object of checking the spreading inflammation or at least rendering it less severe; but this procedure has been superseded by other methods of treatment. For application to the skin a solution in Spirit of Nitrous Ether is recommended. This solution deposits a light-colored precipitate but itself does not turn black like the simple alcoholic solution. It blackens the skin however in a shorter time than any other solution.

In general surgery the moulded stick (lunar caustic) is much employed to cut down exuberant granulations in suppurating wounds and to stimulate the healing of indolent ulcers, sores and sinuses. Bedsores may often be prevented by painting the red but unbroken skin with a 2 to 4 per cent. solution. Cysts and hydroceles may be cured by the injection of a strong solution into them after evacuating their contents, the result being the exciting of an adhesive inflammation which obliterates the sac. In chronic dysenteric ulcers a mild solution, 60 grains in 60 ounces of water, is used by enema after clearing away the contents of the lower bowel.

The internal use of Silver Nitrate is almost wholly confined to the treatment of affections of the gastro-intestinal tract. Its astringent and tonic actions are sometimes very efficient in cases of weak and irritable stomach accompanied by great depression of spirits, morbid apprehensions and want of courage. It is employed in persistent vomiting, in chronic gastric catarrh, in hematemesis, and in gastric ulcer. When given for stomach affections it should be administered when the viscus is empty. Chronic gastritis has been treated with benefit by irrigating the stomach with solutions of various strengths, from 2 to 4 grains gradually increased to 20 grains in 6 drachms of water, immediately followed by a 3 to 5 per cent. solution of common salt. The Nitrate has often proved of value in chronic inflammation of the large and small intestine, especially where there was ulceration of the intestinal mucous membrane. It has done good service in some epidemics of acute dysentery, has been praised in cholera infantum after the acute symptoms abated, and has given marked relief to the pain in catarrh of the biliary ducts. Its employment in spinal sclerosis, labio-glosso-laryngeal paralysis and similar affections has not proved very successful, but it is said to be one of the few remedies which are of any service in locomotor ataxia. It was formerly used as a nerve tonic in epilepsy, but has been superseded by other agents which are less objectionable and more efficient. It has cured epilepsy where the bromides have failed, and it is well established that patients who have been subjected to a course of silver medication which has produced a deposit of the metal in the tissues secure a remarkable degree of immunity from various minor nervous ailments. It may be inferred that a remedy which is deposited in the tissues may interfere by its presence with the chemical activity of adjacent atoms, preventing their explosive union (Murray).

The Oxide is the least irritant of the silver salts and does not discolor the skin so quickly as the nitrate, but eventually the same result follows its continued administration. It has been employed with more or less success in gastric neuralgia, irritable dyspepsia, pyrosis, gastric and pulmonary hemorrhages, dysmenorrhea, menorrhagia and other uterine affections, also to check profuse sweating, to relieve vomiting even in severe gastritis, and to control diarrhea depending on reflex nervous irritation. As an ointment, 5 to 10 grains to the drachm of lard, it is employed for application to venereal sores and to the urethra in gonorrhea. The Iodide has been used in gastric affections, dysmenorrhea and epilepsy, but has no advantage over the other silver preparations.

Unofficial Silver Compounds.

As the Nitrate is precipitated by proteids and by chlorides its disinfectant action is more limited than that of many other antiseptics. To avoid this precipitation and obtain more penetrating action several new silver compounds have been introduced, many of which possess special trade names and all are highly vaunted for their efficiency in the treatment of gonorrhea. The following are the most important of these preparations.

Actol, *Silver Lactate,*—is a white, inodorous and tasteless powder, which coagulates albumin and is soluble in 20 of water. It lessens putrefaction in the bowel and constipates to some extent. The compounds which it forms with the juices of the tissues or the secretions of wounds are soluble ones, which gradually permeate the tissues and extend its action to some distance from the surface. Credé considers that this salt fulfils all the requirements of an efficient antiseptic better than any other silver compound. A solution of 1 in 1000 destroys all pathogenic microbes within five minutes. For gargles, mouth-washes, etc., solutions of 1 in 8000 to 1 in 4000 are used, though stronger ones do not irritate. In surgical affections it may be employed hypodermically. In erysipelas the amount thus administered daily ranges from 7 to 20 grains, but the solution used must not be stronger than 1 in 200, lest coagula of the albumin form and prevent the remedy getting into the circulation.

Argentamin,—is a patented preparation consisting of Silver Phosphate 10 per cent., dissolved in a 10 per cent. solution of Ethylene-diamine. It is an efficient antiseptic and astringent, but the alkaline diamine renders it somewhat irritant. Aqueous solutions of various strengths, from 1 in 5000 to 1 in 1000, are recommended as urethral injections in gonorrhea.

Argentol, *Silver Oxy-chinolin-sulphonate,*—is a combination of Silver and Quinaseptol, and occurs as a sparingly soluble yellowish powder, which is used as a substitute for iodoform in wounds, skin diseases, syphilitic sores, etc., also as an injection for gonorrhea. In ointment the usual strength is 1 or 2 per cent., for injections 1 to 3 in 1000.

Argonin,—is a patented combination of Silver (4 per cent.), Casein and an alkali, occurring as a white powder which is soluble in hot water, non-irritant, not precipitated by chlorides or albumin, and does not stain the hands or clothing. It is a weaker antiseptic than argentamin or silver nitrate, and has no effect on intestinal microbes. In the conjunctival sac its solutions are non-irritant, but it is said to give good results in catarrhal and purulent conjunctivitis. In gonorrhea a 2 per cent. aqueous solution is first used, the strength being gradually increased up to 10 per cent. Its solutions should be protected from the action of light.

Itrol, *Silver Citrate*,—is a fine, light, inodorous and tasteless powder, soluble in 3800 of water. Even in very weak solutions it is an energetic antiseptic, disinfectant and germicide, has a powerfully destructive action on gonococci, is readily borne by the urethral mucous membrane, has deep-reaching power but no injurious effect on the tissues, and therefore meets all the requirements of an efficient injection for gonorrhea (Werler). In that affection the solutions should be very weak at first, 1 in 8000, gradually increased as the inflammation subsides until the full strength of 1 in 3800 is reached. It is very efficient in acute and chronic gonorrhea, in gonorrheal inflammation of the vulvo-vaginal gland and in chronic cystitis. As an ointment for the treatment of wounds and skin diseases the strength is 1 in 100 or 1 in 50 of Lanolin. Solutions should be protected from light in amber-colored bottles.

Largin,—is an albumin-silver compound, containing in the air-dried condition 11 per cent. of silver. It occurs as a gray powder, soluble in 10 of water, and is a powerful astringent and germicide, non-irritant and not precipitated by chlorides or albumin. It is used in gonorrhea, the solutions being of ¼ to 1½ per cent. strength, according to the stage of the affection.

Protargol,—is a protein-silver compound, containing 8 per cent. of metallic silver, and occurring as a yellow powder, readily soluble in water. It is claimed to be absolutely non-irritant, either in the conjunctival sac or the urethra. It is highly praised by Neisser as an antiseptic and astringent application in ¼ to 2 per cent. solutions for affections of the conjunctiva, also for wounds and gonorrhea.

Silver and Sodium Hyposulphite,—is very soluble in water, does not coagulate albumin, and may be given by the stomach or hypodermically. It has been used internally for locomotor ataxia and is preferred to silver nitrate for local application to the throat, being more agreeable to the taste. It does not stain the skin or the clothing. Dose, by the mouth, gr. ss–iij; hypodermically, gr. ⅙–¼ daily.

ARNICA,—is the plant *Arnica montana* or Leopard's Bane, a perennial of the nat. ord. Compositæ, indigenous to the mountains of Northern Europe and Siberia, and said to have been found in the mountains about the headwaters of the Missouri and Columbia rivers. It has large orange-yellow flowers and a small, curved rhizome with several rootlets. Both the flowers and the roots are official. Its most important constituent is *Trimethylamine*, C_3H_9N, an ammoniacal alkaloidal principle, which is probably the active ingredient. It also contains *Arnicin*, *Inulin*, *Capronic* and *Caprylic Acids*, tannin, mucilage, resins, and two essential oils, one of which exists in the flowers, the other in the root.

Arnicæ Flores, *Arnica Flowers*,—the flower-heads of *Arnica montana*, large and yellow, of feebly aromatic odor and bitter, acrid taste.

Arnicæ Radix, *Arnica Root*,—the rhizome and rootlets of *Arnica montana*, is externally brown and rough from leaf-scars, internally whitish, with a thick bark containing a circle of resin-cells and a large, spongy pith. Odor somewhat aromatic, taste pungent, aromatic and bitter. Resembles *Valerian*, which is distinguished by its smell; *Serpentaria*, which has many contorted rootlets; and *Veratrum Viride*, which has thicker rootlets. Dose, gr. v–xx.

Preparations of the Flowers.

Tinctura Arnicæ Florum, *Tincture of Arnica Flowers*,—strength 20 per cent. Dose, ♏v–xxx.

Infusum Arnicæ, *Infusion of Arnica* (Unofficial),—Arnica flowers 20, to 100 parts of water, is thought by many observers to be the best form for local use, as it does not excite dermatitis, probably from containing none of the Volatile Oil, nor the insoluble principle Arnicin.

Preparations of the Root.

Extractum Arnicæ Radicis, *Extract of Arnica Root*,—Dose, gr. j–iij.

Extractum Arnicæ Radicis Fluidum, *Fl. Extr. of Arnica Root*,—Dose, ♏v–xx.

Tinctura Arnicæ Radicis, *Tincture of Arnica Root*,—10 per cent. Dose, ♏v–xxx.

Emplastrum Arnicæ, *Arnica Plaster*,—contains Extract of Arnica Root 33 parts to 67 of Lead Plaster.

Derivative.

Trimethylamina, *Trimethylamine*, C_3H_9N (Unofficial),—is a thin, colorless, strongly alkaline liquid, boiling at 49° F., and at ordinary temperatures a colorless, inflammable gas. The Hydrochlorate is the most stable salt, crystallizing in white or colorless prisms, nearly odorless, of pungent taste, very deliquescent, freely soluble in water and in alcohol. Dose, gr. ij–iij in syrup every 2 hours.

Trimethylamine has been obtained from Arnica flowers and those of several other plants, from Ergot, Hops, Codeine, Cod-liver Oil, and decomposing albuminous substances, such as human urine, herring-pickle, and the residue left in making sugar from beets. It is sometimes incorrectly named *Propylamine*, a term also applied to an impure trimethylamine, but in reality an allied and isomeric compound.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Arnica is irritant, stimulant, depressant, antipyretic, diuretic and vulnerary. It irritates the gastro-intestinal tract, and in some persons the local use of alcoholic preparations of the flowers will excite erysipelatous inflammation of the skin, though those of the root have not been observed to do so. In small doses internally it increases the action of the heart, raises the arterial tension and stimulates the action of the skin and the kidneys. Large doses produce a transient excitement, followed by depression of the circulation, respiration, and nerve-centres; headache, unconsciousness, and even convulsions being induced, the body-temperature lowered, the pupils dilated, and muscular paresis produced. A toxic dose paralyzes the nervous systems of animal and organic life, causing collapse and death.

Arnica is a popular remedy with those who patronize the so-called homeopathic school of practice, but like many other agents which the homeopathists claim to have given to medicine, it is a remedy much older than homeopathy, and was investigated originally by regular physicians, notably by Van der Kolk in the sphere of mental affections. Externally, the tincture in water has a popular reputation in sprains, bruises, etc., though an infusion is better for local use. Ecchymoses are rapidly dispersed by its administration internally as well as externally; and for internal bruises from shock or concussion its internal use has proven very efficacious. The aqueous preparation applied locally promotes the rapid union of cut surfaces.

Internally, besides its value as previously noted, Arnica is undoubtedly employed effectively in typhus and typhoid fevers as a stimulant and antipyretic; also in delirium tremens, rheumatism and rheumatic gout, hemorrhages, epistaxis, hemoptysis, amaurosis, concussion of the brain, chronic dysentery and paralysis of the bladder, it has rendered good service. In idiopathic mania, after the first excitement has diminished. Arnica, in aqueous preparation internally, has given great satisfaction. It has often checked an exhausting diarrhea after many other remedies have failed.

Trimethylamine is an active escharotic and a gastro-intestinal irritant. It lowers the rate and force of the heart, decreases the body-temperature, and diminishes (though sometimes increases) the excretion of urea. The Hydrochlorate is a powerful antipyretic in doses of gr. ij every 3 hours. It has been found useful in acute rheumatism and gout, relieving pain, reducing temperature, and diminishing the frequency of the pulse. In chronic rheumatism, as a liniment (1 to 3 of Glycerin), it is said to give relief equal to that produced by any anodyne. It has been used with benefit in chorea, moderating the spasmodic movements when not suspending them entirely.

ARSENUM, Arsenic, As.—The metal Arsenic is not used in medicine, but is represented by one of its Oxides, a salt of another Oxide, and the Iodide, which are official; together with four preparations of these compounds, or of their salts, viz.:—

Arsenic Compounds and their Preparations.

Acidum Arsenosum, *Arsenous Acid* (*Arsenic Trioxide, White Arsenic*), As_2O_3,—is a heavy, white solid, occurring as an opaque powder, or in semi-transparent masses having usually a striated appearance, soluble in 30 to 80 of water at 59° F., the solubility varying with its physical condition, also soluble in 15 of boiling water, in alkalies and their carbonates, in hydrochloric acid and in glycerin. It is volatilized at 424.4° F. without melting, and when thrown on ignited charcoal it emits an alliaceous odor. Arsenous Acid is obtained by roasting native arsenides, and condensing the fumes in a long horizontal chimney. Dose, gr. $\frac{1}{30}$ to $\frac{1}{10}$.

Liquor Acidi Arsenosi, *Solution of Arsenous Acid,*—is a 1 per cent. solution in HCl and Distilled Water. Dose, ♏ij–viij, thrice daily in water after meals.

Liquor Potassii Arsenitis, *Solution of Potassium Arsenite* (*Fowler's Solution*),—is a 1 per cent. solution, prepared by boiling together Arsenous Acid 1, Potassium Bicarbonate 2, Comp. Tincture of Lavender 3, and Distilled Water to 100. Dose, ♏ij–viij, in water thrice daily after meals.

Sodii Arsenas, *Sodium Arsenate,* $Na_2HAsO_4 + 7H_2O$,—is a salt of the second oxide, Arsenic Acid, As_2O_5. Occurs in colorless prismatic crystals, of feebly alkaline taste and a feebly alkaline reaction, soluble in 4 of water at 59° F., very soluble in boiling water, hardly soluble in alcohol. Dose, gr. $\frac{1}{16}$–$\frac{1}{8}$; of the dried salt, gr. $\frac{1}{24}$–$\frac{1}{12}$.

Liquor Sodii Arsenatis, *Solution of Sodium Arsenate* (*Pearson's Solution*),—is a 1 per cent. solution of the dried Arsenate in Distilled Water. Dose, ♏ij–viij, in water after meals.

Arseni Iodidum, *Arsenic Iodide,* AsI_3,—occurs in glossy, orange-red crystalline masses or scales, gradually losing iodine by exposure to the air, soluble in 7 of water and i 30 of alcohol at 59° F.; is gradually decomposed by boiling water and by boiling lcohol, and is completely volatilized by heat. Dose, gr. $\frac{1}{20}$–$\frac{1}{8}$.

Liquor Arseni et Hydrargyri Iodidi, *Solution of Arsenic and Mercuric Iodide* (*Donovan's Solution*),—has Arsenic Iodide and Mercuric Iodide, of each 1 part in 100 of Distilled Water. Dose, ♏ij–viij, in water after meals.

Unofficial Arsenic Compounds.

Cupri Arsenis, *Cupric Arsenite*,—occurs in the various cupro-arsenical pigments used for wall-paper coloring and as insect-poison, viz.—Scheele's green, Mineral green, Paris green, etc. Is highly poisonous. Dose, gr. $\frac{1}{100}$ daily, in divided doses.

Liquor Arseni Bromidi, *Solution of Arsenic Bromide* (*Clemens' Solution*),—so named by Dr. Clemens, who described it as a chemical union of Arsenic and Bromine, but the action of Bromine on Arsenous Acid results in the formation of Arsenic Acid and Hydrobromic Acid, and the preparation is rather a Liquor Potassii Arsenatis et Bromidi. It contains Arsenic equal to 1 per cent. of Arsenous Acid; and is prepared by boiling together Potassium Carbonate and Arsenous Acid, ʒj of each in ℥x of distilled water, until a clear solution is formed; when cold ʒij of Bromine and ℥xij of water are added, and the mixture is allowed to stand until all color disappears, when it is ready for use. Dose, ♏j–v, thrice daily in water after meals.

Solutions of the Bromides of Arsenic and Gold (Arsenauro), of Arsenic, Gold and Mercury (Mercauro), of Arsenic, Gold and Calcium (Calcauro), and of Arsenic, Gold and Manganese (Manganauro), are described under the title AURUM.

PHYSIOLOGICAL ACTION.

Arsenous Acid, when applied to the skin denuded of its epidermis, acts as a painful escharotic, producing violent inflammation and resulting in a slough which forms a barrier to its absorption. If applied in dilute solution over a large surface, it will be absorbed, and may produce the systemic effects to be described.

In small doses it is a stomachic and general tonic, promoting the appetite and digestion, increasing the cardiac action, the respiratory power, and the intestinal secretions; stimulating peristalsis, exalting mental activity and the sexual appetite, and producing a fair skin and a rotund form. When tolerance of the drug is established, large doses are used with impunity, as by the arsenic eaters of Styria, who can swallow at once as much as 5 grains with safety. They are careful, however, not to take any water into the stomach at the same time, so that the dose is slowly absorbed, and probably eliminated rapidly. Not all those who begin its use can acquire tolerance of it, but those who do so seem to continue it without injury, and live to an old age, undergoing great exertion without exhaustion, and being enabled to ascend steep mountains without difficulty of respiration.

In full medicinal doses, continued for some time, it causes itching and edema of the eyelids, ptyalism, nausea and vomiting, diarrhea or dysentery, epigastric pain and soreness, feeble and irritable heart, dyspnea, disordered sensibility, herpes zoster, urticaria, eczema and other skin eruptions, jaundice and albuminuria.

In large doses it is a powerful irritant to the gastro-intestinal and bronchial mucous membranes. *Toxic doses* may produce either symptoms of gastro-enteritis, or those of profoundly narcotic character. In the first and most usual form of acute arsenical poisoning, there is burning pain in the throat and stomach extending over the abdomen, vomiting, thirst, bloody stools, strangury, suppressed, albuminous or bloody urine, rapid and feeble heart, great anxiety, cold breath, finally exhaustion and collapse,—a group of symptoms much resembling cholera. The autopsy shows erosions, ecchymoses, and softening of the gastro-intestinal mucous membrane, congestion of the lungs and bronchi, and fatty degeneration of the liver, kidneys and cardiac muscle. The poison is found in the urine, saliva, tears, sweat, etc., and may be detected even in the parenchymatous tissues. In the nervous form of poisoning by arsenic, profound coma and insensibility come on suddenly without any gastro-intestinal symptoms.

Arsenical preparations are generally classed as alteratives, but they are valuable tonics and antiseptics, and possess antiperiodic powers second only to those of Quinine.

Chronic Arsenical Poisoning may occur from the inhalation of arsenical vapors or dust arising from wall-papers or other substances containing the poison. The quantity necessary to produce symptoms of poisoning when inhaled seems to be very small. The most prominent symptoms are, at first increased appetite, next colicky pains, mucous or dysenteric stools, irritation of the eyes, coryza, a short, dry cough, and a white and silvery tongue, all accompanied by great bodily prostration.

The long-continued use of arsenic may induce peripheral neuritis, the chief symptoms of which when so caused are—severe darting pains in the limbs, paralysis of the muscles of the extremities, especially the extensors of the hands and feet, ataxic gait, herpes zoster, and rapid muscular atrophy. In several cases it has caused general brown pigmentation of the skin, and may give rise to the same pigmentation of psoriasis patches. After death from chronic poisoning, in addition to the gastro-intestinal and nervous lesions, there is found wide-spread fatty degeneration, affecting most of the organs, but particularly the liver, kidneys, stomach and muscles, including the heart.

To avoid arsenical poisoning during a course of the drug, full doses (♏x of Fowler's Solution) should be used at the commencement, and always taken on a full stomach. The dose should then be steadily reduced. Susceptible persons often tolerate it better if a few drops of laudanum are administered with each dose.

Antidotes and Incompatibles.

Poisoning by Arsenic is treated by prompt evacuation of the stomach, and washing it by means of the stomach pump, then Magnesia, Chalk, and Lime-water freely, or better still, the chemical antidote to Arsenic in solution, viz., the *Hydrated Oxide of Iron*, freshly precipitated and in a soft magma, in the proportion of gr. viij for each grain of the poison ingested. (See FERRI OXIDUM HYDRATUM for the preparation of this antidote.) Oil or mucilaginous drinks should be given to protect the mucous membranes, and diluents, alkaline mineral waters or Iodide of Potassium to promote elimination. *Dialyzed Iron* has been shown to be quite efficient as an antidote, and is more easily obtained than the hydrated oxide. It has rendered good service in many cases of poisoning from inhalation of arsenical fumes.

Incompatibles are salts of Iron, Magnesium and Calcium, also Astringents.

THERAPEUTICS.

Externally, Arsenic has been employed in the form of paste as a depilatory, and as an escharotic in cancers, but is excessively painful. Most of the secret "cancer cures" have arsenous acid for their basis. Internally, it is used as a tonic and astringent to the intestinal canal, as a tonic and antispasmodic in nervous diseases, and for its action on tissue change. It is of especial value in irritative dyspepsia, gastralgia, pyrosis, gastric ulcer or cancer, regurgitation of food without nausea, diarrhea coming on immediately after taking food, vomiting of drunkards and chronic alcoholism. It has proven of signal service in the commencement of phthisis, also in catarrhal pneumonia, probably by causing fatty degeneration of the exudation in the alveolar cavities, thus breaking it up and quickening its absorption. It is often very serviceable in chronic bronchitis with copious expectoration, in acute catarrh, hay fever, whooping-cough, asthma, chorea, epilepsy, angina pectoris and other spasmodic nervous disorders. In many forms of neuralgia it frequently gives prompt and permanent relief, especially in cases due to malarial poisoning. As an antiperiodic, it has high rank, being, however, of particular value in chronic malarial poisoning, and as an adjunct to Quinine in the intervals between the paroxysms of intermittents. Anemia and chlorosis are remarkably benefited by it, and in rheumatic arthritis and chronic rheumatism it is sometimes of great service. In chronic scaly and papular skin diseases its value is very great, but it is not serviceable in acute forms, and the more chronic the cutaneous affection the more likely it is to be amenable to Arsenic. Epithelioma may be retarded by small doses long continued, and it has certainly been useful in delaying the progress of other cancers, particularly scirrhus of the stomach and uterine carcinoma. Hypodermically its solutions have been extremely efficient in histrionic spasm, local chorea of the head and neck, obstinate cases of general chorea, and in lymphadenoma.

The so-called Bromide of Arsenic, in the form of Clemens' Solution, has rendered good service as a remedy for diabetes mellitus of hepatic origin. Cupric Arsenite is highly recommended in typhoid fever.

ASAFŒTIDA, Asafetida,—a gum-resin obtained by incision from the living root of *Ferula fœtida*, a perennial herb of the nat. ord. Umbelliferæ, native of Persia and Afghanistan. It occurs in whitish tears embedded in a grayish sticky mass, of alliaceous odor and taste, soluble in alcohol to at least 60 per cent., and when triturated with water it yields a milk-white emulsion. Its principal constituent is a *Sulphuretted Volatile Oil*, consisting chiefly of Allyl Sulphide, $C_6H_{10}S$; it also contains a gum and a resin, with ferulaic, malic, acetic, formic and valerianic acids. Dose, gr. v–xx.

Preparations.

Tinctura Asafœtidæ, *Tincture of Asafetida*,—strength 20 per cent. Dose, ʒ ss–ij.

Emulsum Asafœtidæ, *Emulsion of Asafetida, Milk of Asafetida*,—strength 4 per cent. in water. Dose, ℥ ss–ij.

Pilulæ Asafœtidæ, *Pills of Asafetida*,—each pill has gr. iij of Asafetida with gr. j of Soap. Dose, j–iv pills.

Pilulæ Aloes et Asafœtidæ, *Pills of Aloes and Asafetida*,—each pill has gr. 1⅓ of each constituent named and the same quantity of Soap. Dose, j–iv pills.

Mistura Magnesiæ et Asafœtidæ, *Mixture of Magnesia and Asafetida, Dewees' Carminative* (Unofficial), has of Magnesium Carbonate 5, Tinct. Asafœtidæ 7, Tinct. Opii 1, Sugar 10, Aqua Dest. q. s. ad 100 parts. Dose, ʒ ss–℥ ss.

Spiritus Ammoniæ Fœtidus (Unofficial),—Asafetida 1½, Liquor Ammoniæ Fortior 2, Alcohol 20 parts. Dose, ʒ ss–j.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Asafetida is a powerful antispasmodic, a stimulant to the brain and nervous system, a stimulating expectorant, also tonic, laxative, diuretic, diaphoretic, emmenagogue, aphrodisiac and anthelmintic in action. Its odor and taste are extremely nauseous and persistent. In small doses continued it causes impaired digestion, alliaceous eructations, acrid sensation in the fauces, gastralgia, flatulent distention, fetid flatulence, burning urination, diarrhea and tenesmus. Full doses produce various nervous or hysterical phenomena, with nausea, vomiting and purging. The Volatile Oil diffuses into the blood and tissues, and is excreted in the urine, sweat, breath, etc. By its action the circulation is stimulated, the arterial tension raised, the power of the cardiac motor ganglia is increased and the cardiac inhibition relaxed. Asafetida also stimulates the brain even to pleasant intoxication, and produces a subjective sensation of warmth without any rise of body-temperature. It stimulates the nervous system, the secretions and excretions, the menstrual flow and the sexual appetite. In Asia it is used as a condiment with food, and though at first it is extremely nauseous to most people, a taste for it may be readily acquired.

The disgust which is generally felt for this remedy makes its use very restricted, though a valuable medicine. The Emulsion is extremely serviceable in the flatulent colic of infants, and as an enema in infantile convulsions. There is no better remedy in hysteria and hypochondriasis with indigestion and flatulence; in constipation with amenorrhea of anemic subjects, due to ovarian and intestinal torpor; in bronchial affections, cough of habit, chronic catarrhs, and flatulent indigestion. It has been highly praised in the treatment of habitual abortion.

ASCLEPIAS, **Pleurisy Root**,—is the root of *Asclepias tuberosa*, a plant of the nat. ord. Asclepiadaceæ and a native of the Eastern and Southern States. Two other species of Asclepias are used in medicine and were formerly official.

Extractum Asclepiadis Fluidum, *Fluid Extract of Asclepias*,—Dose, ʒss-j.

An Infusion or Decoction may be made in the proportion of ℥j of the powdered root to a quart of water, and given in teacupful doses every 2 or 3 hours.

Asclepias contains two resins, a peculiar principle, tannic and gallic acids, albumin, pectin, gum, various salts and a volatile, odorous, fatty matter. It is emetic and cathartic in full doses, also diaphoretic and expectorant, as well as depressant to the action of the heart, and probably slightly sedative and astringent. It is a popular remedy in the Southern States for pleurisy (hence its common name), and has been used in medicine for catarrh, pneumonia, phthisis, diarrhea, dysentery, rheumatism, gastralgia, and to promote the eruption in exanthematous fevers. It is undoubtedly a powerful diaphoretic.

ASPIDIUM,—is the rhizome of *Dryopteris Filix-mas* (Male Fern) and of *Dryopteris marginalis* (Marginal Shield Fern), plants of the nat. ord. Filices, the former found in most parts of the world, the latter indigenous to N. America. The active principle is *Filicic Acid*, $C_{14}H_{18}O_5$, which is extracted in the oleoresin. It also contains a green, fatty oil, a volatile oil, resin, tannin, etc. Dose, ʒss–ʒjss in a single dose fasting, or in divided doses at short intervals, followed by a purgative.

Oleoresina Aspidii, *Oleoresin of Aspidium*,—is an ethereal extract and deposits Filicic Acid on standing. It should be well shaken before being used. Dose, ʒss–ʒj, in capsules, repeated every 3 hours for 2 or 3 doses.

Aspidium is an efficient vermicide against tapeworm, particularly the unarmed variety (Bothriocephalus latus). The Oleoresin is the best form in which to use it, the patient having fasted for the previous day, or used only a milk diet, ʒj may then be given in 4 doses ¼ hour apart. This may be repeated the next morning and followed by three drops of croton oil in emulsion. This is one of many methods. Cusso may be combined with it advantageously. A formula for a mixed treatment by Aspidium, Pomegranate and Pumpkin-seed is given under the title GRANATUM.

ASPIDOSPERMA, **Aspidosperma**, *Quebracho*,—is the bark of *Aspidospermo Quebracho-blanco*, a large evergreen tree of the nat. ord. Apocynaceæ, growing in Chili and the Argentine Republic. The name is one given in S. America to any very hard wood (*quebrar hacho*, to break the axe), and the particular tree above named is known as *Quebracho-blanco*, from the white color of its wood. It contains several alkaloids, no one of which represents the action of the bark itself; the most important being *Aspidospermine*, $C_{22}H_{30}N_2O_2$, and *Quebrachine*, $C_{21}H_{26}N_2O_3$.

Several false Quebrachos are found on the market, that most frequently seen being the bark of *Loxopterygium Lorentzii*, or *Quebracho colorado*, an Argentine tree of the order Terebinthaceæ.

Extractum Aspidospermatis Fluidum, *Fluid Extract of Aspidosperma,*—is the only official preparation. Dose, ♏v–ʒj.

Tinctura Quebracho, *Tincture of Quebracho* (Unofficial),—strength 20 per cent. Dose, ʒj-iv.

Vinum Quebracho, *Wine of Quebracho* (Unofficial). Dose, ʒj–℥j.

Extractum Quebracho, *Extract of Quebracho* (Unofficial). Dose, gr. ij–x.

Aspidosperma is a bitter tonic of disagreeable taste, increasing appetite and promoting digestion. It lowers the action of the heart, reduces arterial tension, and slows respiration, also decreasing the sensation of need of air after active exercise. In large doses it causes severe salivation, nausea, vomiting, vertigo and headache. In animals it paralyzes the motor nervous system and lowers the reflexes, producing great dyspnea and finally death, apparently from asphyxia.

This drug has long been used in Chili as an antiperiodic, a stomachic tonic and a remedy for dyspnea. In the latter condition it is reported to be remarkably palliative, especially when due to emphysema, uremic and spasmodic asthma, spasmodic cough and chronic bronchitis. It is not efficient in dyspnea from organic diseases of the heart, or in that of aged subjects of atheroma.

Aspidospermine is actively poisonous to the respiratory apparatus and circulation in both cold- and warm-blooded animals, in the former the respiration being chiefly affected, in the latter motor ganglia of the heart. Lowered temperature, dyspnea, stupor and convulsions occur before death. It has been used as an antipyretic, also in cardiac neuroses and in asthma. Its salts are freely soluble in water, but the alkaloid itself is soluble only in oils and fats, 6 to 8 parts being readily incorporated with 100 of cod-liver oil by the aid of heat. The average dose is about gr. j–ij.

AURANTIUM, Orange,—occurs in two official varieties of fruit and flowers, viz.—those of *Citrus vulgaris*, the Bitter Orange, and *Citrus Aurantium*, the Sweet or Portugal Orange, both trees of the nat. ord. Aurantiaceæ, cultivated in almost all warm countries. Other varieties are described under LIMON. The official titles are—

Aurantii Amari Cortex, *Bitter Orange Peel,*—the rind of the fruit of *Citrus vulgaris*, characteristics well known. Contains a Volatile Oil isomeric with Oil of Turpentine, $C_{10}H_{16}$, and a bitter crystalline principle, *Hesperidin* or *Aurantiin*.

Aurantii Dulcis Cortex, *Sweet Orange Peel,*—is the rind of the fresh fruit of *Citrus Aurantium.* It contains a Volatile Oil differing from that of the bitter orange, and less of the bitter principle.

Preparations.

Extractum Aurantii Amari Fluidum, *Fluid Extract of Bitter Orange Peel.*—Used as flavoring. Dose, ʒss–j.

Tinctura Aurantii Amari, *Tincture of Bitter Orange Peel,*—strength 20 per cent. Dose, ʒj–ij. A flavoring preparation.

Tinctura Aurantii Dulcis, *Tincture of Sweet Orange Peel,*—strength 20 per cent. Dose, ʒj–ij. A flavoring preparation.

Syrupus Aurantii, *Syrup of Orange,*—Sweet Orange Peel 5, Calcium Phosphate Precip. 5, Sugar 70, Alcohol and Water to 100. Dose, ʒj–ij. Used for flavoring.

Syrupus Aurantii Florum, *Syrup of Orange Flowers,*—Sugar 85, Orange-flower Water to 100. Dose, ʒj–ij. A delicate flavoring agent, but having to some persons an extremely sickish taste.

Spiritus Aurantii, *Spirit of Orange,*—Oil of Orange Peel 5, Deodorized Alcohol 95. Dose, to be regulated by the quantity of alcohol desired.

Spiritus Aurantii Compositus, *Compound Spirit of Orange,*—Oil of Orange Peel 20, Oil of Lemon 5, Oil of Coriander 2, Oil of Anise ½, Deodorized Alcohol to 100. Dose, as for alcohol.

Aqua Aurantii Florum Fortior, *Stronger Orange-flower Water,*—is water saturated with the volatile oil of fresh orange flowers. Dose, indefinite, for flavoring. Used to prepare—

Aqua Aurantii Florum, *Orange-flower Water,*—consists of equal volumes of the preceding and Distilled Water, mixed immediately before use. Dose, indefinite.

Oleum Aurantii Corticis, *Oil of Orange Peel,*—a volatile oil, obtained by expression from the fresh peel of either orange. Is soluble in about 4 times its volume of alcohol, and is an ingredient of the two official Spirits of Orange and also of Spiritus Myrciæ (Bay Rum). Dose, gtt. j–v.

Oleum Aurantii Florum, *Oil of Orange Flowers* (*Oil of Neroli*),—a volatile oil, distilled from the fresh flowers of the bitter orange. Is the most important constituent of Cologne Water (Spiritus Odoratus), and is soluble in an equal volume of Alcohol. Dose, gtt. j–v.

Elixir Aromaticum, *Aromatic Elixir* (*Simple Elixir*),—has of the Comp. Spt. of Orange 1.2, Precipitated Calcium Phosphate 1½, Syrup 37½, Deodorized Alcohol and Distilled Water to 100. A flavoring vehicle. Dose, ʒj–℥j, or more.

Orange is aromatic and tonic, also more or less bitter, but has little action except a mild stimulant influence on the nervous system due to its volatile oil. Persons much exposed to its fumes are liable to cutaneous eruptions and various nervous disorders. The oil may produce violent colic and convulsions in children, one case being reported in which death resulted from eating the rind. Its use in medicine is confined to flavoring purposes, though the preparations of the Bitter Orange may be used as gentle tonics and stimulants to the digestion, but they are usually combined with more energetic agents.

AURUM, Gold, Au,—is represented by only one official salt, the Gold and Sodium Chloride, but triturations of the metal itself may be prepared, according to the general pharmacopœial formula for such preparations. The unofficial solution of Gold and Arsenic Bromide is a very efficient preparation. Fine gold and a solution of the perchloride are in the Br. Ph., and powdered gold, also the oxide, chloride, sodio-chloride, iodide and cyanide, are official in the French Codex.

Official Preparation.

Auri et Sodii Chloridum, *Gold and Sodium Chloride*,—is a mixture composed of equal parts of dry Gold Chloride, $AuCl_3$, and Sodium Chloride, $NaCl$; and occurs as an orange-yellow powder, of saline and metallic taste, slightly deliquescent in damp air, very soluble in water, partly soluble in alcohol, and contains about 32 per cent. of pure gold. Its solutions are decomposed by organic substances, by light, and by almost all salts. Dose, gr. $\frac{1}{30}$–$\frac{1}{5}$, once or twice a day. The Ph. Ger. gives the maximum single dose as gr. ¾, and the maximum daily dose as gr. iij, but these doses are too high.

Unofficial Preparations.

Auri Pulvis, *Powdered Gold*,—may be obtained by triturating gold leaf with ten times its weight of sugar of milk or potassium sulphate until brilliant particles are no longer visible in it, and then washing the diluent away with boiling water. A *Trituration of Gold* may be prepared in the same manner, retaining the sugar of milk, as directed by the pharmacopœia under the title TRITURATIONES. Dose of powdered gold is gr. $\frac{1}{8}$–gr. j, or a little of it may be applied by friction to the sides of the tongue.

Auri Chloridum, *Gold Chloride*,—also called the perchloride or terchloride of gold ($AuCl_3$), the "potable gold" of the alchemists,—occurs in needle-shaped prisms of a deep orange color, very deliquescent and freely soluble in water, in alcohol and in ether. Dose, gr. $\frac{1}{60}$–$\frac{1}{30}$, in pill or solution, preferably the latter. The commercial salt so named, and much used by photographers, is not the pure chloride but a crystallized double salt of gold and sodium, containing 50 per cent. of metallic gold.

Auri Bromidum, *Gold Bromide*, $AuBr_3$,—occurs as a yellowish-gray, friable mass, which is insoluble in water but soluble in ether, and contains 55 per cent. of Bromine. Dose, gr. $\frac{1}{20}$–$\frac{1}{6}$, but against migraine the minimum quantity should be used twice daily an hour before meals.

Auri et Sodii Bromidum, *Gold and Sodium Bromide*, $AuBr_3NaBr.2H_2O$,—may be used hypodermically in solution, 2 parts to 100 of distilled water, the dose of which is ♏viij increased to ♏xxxij, respectively representing $\frac{1}{6}$ to $\frac{2}{3}$ of a grain.

Liquor Auri et Arseni Bromidi, *Solution of Gold and Arsenic Bromide* (Barclay),—is marketed under the trade-name "*Arsenauro*," and contains gr. $\frac{1}{32}$ of each salt in ♏x. Dose, ♏v–xv in water, thrice daily after meals, or hypodermically.

This solution may be prepared as follows: (1) Take of Nitric Acid ʒj and of Hydrochloric Acid ʒiij, mix them and dissolve in the mixture 21 grains of pure Gold, then evaporate to dryness in a water-bath. Dissolve the resulting Chloride of Gold in distilled water ℥j, and add slowly a solution of 35 grains of Ammonium Bromide in ʒiv of water. Shake with Squibb's ether until all the gold is taken out, separate in a separating funnel, and treat the ether solution with fused calcium chloride to remove all water. Distil off the ether, and dissolve the remaining Gold Bromide in ℥iv of water to make *Solution No. 1.* (2) Dissolve 48¾ grains of Arsenous Acid in ℥iv of distilled water by the aid of heat, and when cold add ʒj of Bromine and let the mixture stand for 24 hours. Then drive off the excess of bromine by boiling in a sand-bath until the solution is colorless, which gives *Solution No. 2.* (3) Mix the two solutions and add sufficient water to make 1 quart.

Liquor Auri, Arseni et Hydrargyri Bromidi, *Solution of Gold, Arsenic and Mercury Bromide* (Barclay),—is marketed under the trade-name "*Mercauro*," and contains gr. $\frac{1}{32}$ of each bromide in ♏x. Dose, ♏v–xv in water, thrice daily after meals, or hypodermically.

Similar solutions of the bromides of gold, arsenic and calcium ("*Calcauro*") and of the bromides of gold, arsenic and manganese ("*Manganauro*"), are on the market and may be used in like doses.

PHYSIOLOGICAL ACTION.

The action of the salts of gold upon the human organism is analogous in many respects to that of mercury, causing local irritation and escharotic effects when applied in substance or in strong solution. In continued medicinal doses given internally they produce a condition of general erethism which closely resembles the mercurial fever, and is accompanied by salivation but without tenderness or ulceration of the gums. The Chloride is one of the most active salts, being, according to Chrestien, even more toxic than corrosive sublimate. Locally, it produces irritant and caustic effects, and imparts a yellow stain to the skin, which later on turns violet and even black, from reduction of the metal therein. In overdoses it causes gastric pain and inflammation, also ulceration of the gastro-intestinal mucous membrane, and otherwise acts as a corrosive poison; toxic doses produce a violent gastro-enteritis with such nervous phenomena as convulsive tremor, cramps, priapism, insomnia and insensibility (Magendie).

The salts of gold, administered in small medicinal doses, increase the appetite and the digestive power and stimulate the functional activity of the secreting organs, especially the skin and the kidneys. They also stimulate the generative apparatus, causing diaphoresis, diuresis, and exciting the menstrual flow in women and the sexual appetite in men. The observations of several competent physicians have established the power of these salts to excite the vascular and muscular systems and to produce fever, to increase the urine and the sweat, to cause salivation without stomatitis, a sense of heat in the stomach, headache and diarrhea, to promote menstruation, excite the genitalia, and profoundly affect the nervous system. In large or continued doses they cause dryness of the tongue, redness of the pharynx, gastric and intestinal colic, nausea and vomiting, and even erosion of the gastric mucous membrane. The Bromide, though containing only 55 per cent. of bromine, is found to be many times more active, weight for weight, than the ordinary bromides. Administered in doses of from ½ grain to 3 grains per kilogramme of body-weight, it depressed the cortical motor centres to such a degree that the strongest electrical stimulation thereof failed to produce an epileptic seizure (Shtcherbak).

Antidotes and Antagonists.

Poisoning by gold salts is treated like that by corrosive sublimate. The *Antidote* is Albumin in some form, followed by evacuation of the stomach, as the albuminate is not wholly inactive. The *Antagonists* are Bismuth, Tannin, Sodium Sulphite, and diluted Nitric Acid, in water, as gargles and mouth washes for the salivation; Belladonna to lessen the salivary secretion, Hyoscyamine for the tremor and Morphine for shock.

THERAPEUTICS.

The literature of gold shows that it is one of the most ancient medicines. Pliny, in the first century, recorded its use as a recognized remedy for several conditions for which it is still employed, including lichenoid eruptions, fistula, hemorrhoids, warts, putrid ulcers, and sores emitting an offensive smell. In the finely divided metallic state it was employed as a panacea by the Arabian physicians and by the alchemists. During the 17th and 18th centuries it was highly esteemed as an antisyphilitic, also for leprosy, dropsies, epilepsy, the pest, fevers, amenorrhea, sterility and uterine diseases. During the first quarter of the present century it was in high repute among the Continental physicians as a remedy for syphilis and for scrofula.

Mitchill (1818) administered gold salts for syphilis in the New York Hospital, with excellent results. In his opinion "the muriate of gold will effect all that is achieved by the muriate of quicksilver, with incomparably less inconvenience to the patient, who gets well under the former without the hazard of a sore mouth or a salivation, and with very little wear and tear of constitution." Trousseau (1851) says that the happy results of gold in the treatment of venereal diseases are incontestable; and von Schroff of Vienna (1868) gave it great praise for the restoration of a case of syphilis in which the strongest mercurials had failed to avert destruction of the nasal bones or the deep, spreading ulcers of the skin. Phillips (1894) says that its efficacy is best seen in the later developments of syphilis, such as ulceration of the nose and larynx, cutaneous syphilides, hard nodes, etc., also that it may especially be employed in long-standing cases with chronic periostitis and when mercury has already been given to saturation. Still it has never obtained general professional favor in the United States or in England until recently. Professor Barton, of Jefferson Medical College, Philadelphia (1827), pronounced the following judgment upon it in his lectures on materia medica. "On the whole view of what has been said in favor of gold, I am not inclined to attach great importance to it as a remedy. It is well enough in its proper place and for its proper purposes, for which it is more useful than as a medicine. Plenty of it would doubtless cure many diseases of mind and body." Such has been the general opinion since the above words were printed, but of late years a number of compounds of gold with other elements (chlorine, bromine, iodine, arsenic and mercury) have been employed as medicines with considerable satisfaction.

Dr. Piffard of New York finds that Gold is unquestionably useful in the later stages of syphilis, and says that its best effects are obtained with very small doses, gr. $\frac{1}{65}$ or less, which he rarely continues for more than one or two weeks at a time. Several other observers have given it great praise as a remedy in constitutions which are broken down by the combined influence of syphilis and mercury, for syphilis in strumous subjects, and for the various manifestations of scrofula. Under its use the auric fever may develop, and the local affections for which it is administered may assume an aggravated intensity, and even new ones appear; but these phenomena do not call for the suspension of the remedy, for the disease retrogrades rapidly in a few days after they appear (Trousseau); and on lessening the dose pyrexia subsides and good effects are more conspicuous (Phillips).

Strumous affections have been frequently reported cured by the internal and local use of auric preparations, including scrofulous ulcers, lupus, ozena, enlarged and indurated cervical glands, and hypertrophy of the tongue with induration thereof. Gold has been credited with many cures of cancer of the uterus, mammæ and tongue, but it is probable that such have really been cases of scrofulous ulceration. Squamous skin diseases, the "dartres" of the older writers, are, next to syphilis, the most successful field for the action of gold. In cutaneous diseases it is used locally as well as internally. Dropsy is one of the affections in which it was anciently recommended, and in which modern therapeutists have found it efficient, especially ascites due to chronic hepatic disease or to induration of the abdominal organs, also post-scarlatinal dropsy and ovarian dropsy.

Many disorders of the female generative organs have proved amenable to gold when persistently employed. Amenorrhea due to ovarian torpor and chronic metritis with scanty menstruation are often benefited thereby, while sterility dependent on these states or due to coldness, is more certainly cured by the auric preparations than by any other merely medicinal means. The tendency to habitual abortion may be averted by the use of the Chloride, which is also beneficial for mental symptoms of hysterical character, especially when connected with uterine disease. Many competent clinicians have highly commended gold in suicidal melancholia, in hypochondriasis accompanying hepatic or testicular disease, in decline of the sexual power in men, and as a tonic for low-spirited, pining boys with undeveloped testes.

Sclerosis of the internal organs, especially the liver and kidneys, may be retarded by the persistent use of the Gold and Sodium Chloride, in doses of gr. $\frac{1}{30}$–$\frac{1}{20}$ thrice daily. Nervous dyspepsia, characterized by a red and glazed tongue, epigastric pain increased by food, and relaxation of the bowels after eating, is greatly benefited by the same salt in equally small doses. Catarrh of the duodenum and bile-ducts, and jaundice therefrom, also vertigo and vertiginous sensations connected with gastric disorders or due to cerebral anemia, are often removed by a course of treatment with the salts of gold. The Bromide has been employed in doses of from gr. ¼ to gr. ½ with decided benefit in obstinate cases of hysteria and epilepsy. Goubert used it successfully for migraine, epilepsy, chorea and exophthalmic goitre, in daily doses of gr. ⅛ to ⅙, continued until its characteristic headache was produced. He claims for it greater efficacy in epilepsy than is possessed by the other bromides, and says that, as compared with them, it is better tolerated and does not induce depression and emaciation or the other pronounced symptoms of bromism.

A combination of Gold and Arsenic (*Auri Arsenas*) was introduced by Chrestien and extensively employed by Massart in cancer and phthisis, with sufficient success to merit the approval of the medical societies of

Lyons and Toulouse. It is said to be particularly serviceable in scrofulous affections, especially lupus, and to exercise a highly beneficial influence on anemia and chlorosis. A solution of the Bromides of Gold and Arsenic has been successfully employed for several years by Dr. Barclay and others in the various diseases of which sclerosis is the chief factor, such as cirrhosis of the liver and lungs, interstitial nephritis, atheroma and calcareous degeneration of the arteries, senile degenerative changes and neurotic disease, fibroid phthisis, locomotor ataxia, etc.; also in cervical adenitis, arthritis deformans, syphilitic neuralgia and iritis, miliary tuberculosis, epilepsy, chronic neuritis, sciatica, chronic muscular rheumatism and neurasthenia. *Arsenauro* is the trade-name of this solution, which has been the subject of extended reports from many competent observers, some of whom claim to have obtained from the use of this combination results which neither of its constituents are capable of when administered alone. It is held to have marked alterative power upon the glandular system and upon all non-malignant scleroses; to be not only a blood-maker but a blood-builder, increasing the number of the corpuscles and improving their quality, and also increasing the amount of hemoglobin therein. It is eliminated by the kidneys and produces no irritation when administered either by the mouth or hypodermically. A similar solution of the Bromides of Gold, Arsenic, and Mercury, named *Mercauro*, is on the market, and is highly praised in the treatment of the late manifestations of syphilis, particularly those affecting the nervous system.

A so-called "*Bichloride-of-Gold Cure*" for inebriety has become highly notorious through extensive advertising and other commercial methods, but from the most reliable information obtainable it is reasonably certain that the only preparation of gold which plays a prominent part therein is the gold coin which passes from the patient's pocket to that of the manager of the "institute." The physiological symptoms produced by the remedy employed are those of strychnine and atropine, the administration of which hypodermically several times daily for three or more weeks is decidedly dangerous. In many cases cardiac failure has occurred soon after the completion of the treatment, and in a large number of instances insanity or other serious psychoses have developed immediately after the subjects had been through one of these so-called "cures."

AVENA SATIVA,—the common Oat, a plant of the nat. ord. Graminaceæ,—was official in the U. S. P. 1870, as *Avenæ Farina*, or Oat-meal. A concentrated tincture or fluid extract has been extensively advertised by drug manufacturers as a nerve stimulant and tonic, especially efficacious in the treatment of chorea, epilepsy, insomnia, nervous exhaustion, alcoholism and the opium-habit. The seeds contain starch, gluten, gum, etc., and form a nutritious food, the meal being made into a porridge, or gruel. In the latter form it is a good demulcent for coughs. The pericarp contains an amorphous alkaloid, which has doubtless some stimulant and narcotic power; but the claims advanced for it, as a specific remedy for the cure of the opium-habit, have been strenuously denied by many competent observers. Dose of the concentrated tincture or fluid extract may be stated at ♏x–ʒij.

AZEDARACH (Unofficial),—is the bark of the root of *Melia Azedarach*, or Pride of China, a handsome tree of the nat. ord. Meliaceæ, indigenous to China and India, but naturalized in the Gulf States. A decoction of the fresh bark (℥ij to Oj boiled to O½) may be used in tablespoonful doses.

This drug is known to produce symptoms of narcotic poisoning, as giddiness, dimness of sight, mental confusion, stertorous breathing, dilated pupils and stupor. Large doses are necessary to cause these effects, and some authorities question their occurrence. It is, however, a gastro-intestinal irritant, producing vomiting and purging, and also an anthelmintic against the round-worm. Its active principle has not been isolated. It is only employed as an anthelmintic against lumbricoid worms, and as the fresh bark is difficult to obtain in any region where it does not grow, other agents are more generally used. It is given to horses affected with "bots."

BALSAMUM PERUVIANUM, Balsam of Peru,—is a balsam obtained from *Toluifera Pereiræ*, a Central American tree, of the nat. ord. Leguminosæ. It occurs as a thick, brown-black liquid, its odor reminding of benzoin and vanilla, soluble in 5 of alcohol, almost insoluble in water, which extracts from it only some Cinnamic Acid and Cinnamein. It is not a true balsam, as it contains no volatile oil. Its composition is: *Cinnamein* (Benzyl Cinnamate, $C_{16}H_{14}O_2$) 60 per cent., *Cinnamic Acid* 6 per cent., *Resins* 30 per cent.; also Benzoic Acid and other bodies. Dose ♏x–xxv, in emulsion. There are no official preparations.

The action of Balsam of Peru is that of its several constituents, namely, antiseptic, disinfectant, stimulant to the circulation, and sedative to the nervous system; acting chiefly on the mucous membrane, it is tonic and expectorant, diuretic and diaphoretic. In large doses, it causes gastralgia, nausea and vomiting, colic and diarrhea. It closely resembles in physiological action its congeners, Styrax and Benzoin.

Balsam of Peru is used locally in chronic skin diseases of inflammatory type and sore nipples, to relieve itching, cleanse bed-sores, promote the healing of wounds and ulcers, and to kill the acarus scabiei, being considered by some authorities the best of all applications in itch. Internally, it is used as a stimulant and disinfectant expectorant in chronic bronchitis, asthma, etc., as well as in gonorrhea, gleet, leucorrhea, and other discharges from mucous membranes. Incorporated with Iodoform it partially covers the odor of that drug.

BALSAMUM TOLUTANUM, Balsam of Tolu,—is a balsam obtained from *Toluifera Balsamum*, a tree of the nat. ord. Leguminosæ, native in Venezuela and New Granada. Its composition and properties are similar to those of Balsamum Peruvianum, except that it is of lighter color, more agreeable odor, and contains a volatile oil, *Tolene*, in the proportion of about 1 per cent.

Tinctura Tolutana, *Tincture of Tolu*,—contains 10 per cent. of the Balsam dissolved in alcohol. Dose, ♏x–xxx.

Syrupus Tolutanus, *Syrup of Tolu,*—has of the Balsam 1 per cent., with Sugar 85, Alcohol 5, and Water to 100. It is much used in cough mixtures, and covers the taste of Chloral Hydrate well. Dose, ʒj–ij.

Balsam of Tolu has similar action to that of Balsam of Peru, but being more agreeable in flavor it is more used internally than the latter. It is chiefly employed as a pleasant excipient in cough mixtures, and is a constituent of the Compound Tincture of Benzoin.

BAPTISIA, Wild Indigo (Unofficial),—is the root bark of *Baptisia tinctoria,* a plant of the nat. ord. Leguminosæ, native in North America, and contains an alkaloid and a resin, neither of which have been examined critically. The so-called *Baptisin* is an impure resinoid, obtained by precipitation from the alcoholic extract with water.

Unofficial Preparations.

Extractum Baptisiæ, *Extract of Baptisia,*—Dose, gr. j–x.
Extractum Baptisiæ Fluidum, *Fluid Extract of Baptisia,*—Dose, ♏ij–xx.
Tinctura Baptisiæ, *Tincture of Baptisia,*—Dose, ♏v–xxx.
Baptisin,—the resinoid. Dose, gr. j–v.

Baptisia has a bitter and acrid taste; in small doses it is laxative, in large ones violently emeto-cathartic, and may excite severe gastro-intestinal inflammation. It is a decided stimulant of the liver, and increases the secretions of the glandular appendages of the gastro-intestinal mucous membrane. It has considerable power as an antiseptic.

Baptisia has been used locally in decoction or cataplasm to obstinate and painful ulcers, in threatening or existing gangrene and gangrenous sores. Internally, it is a useful remedy in amenorrhea, typhoid and typhus fevers, variola, scarlatina, and epidemic dysentery. In the common continued fever, or in the first stage of typhoid, it will be found of great service in drop-doses of a fresh tincture, repeated every hour.

BARII DIOXIDUM, Barium Dioxide, *Barium Peroxide,* BaO_2,—is the commercial anhydrous Barium Dioxide, a heavy, grayish-white, amorphous powder, odorless and tasteless: gradually decomposed by exposure to the air, from which it slowly takes up moisture and carbon dioxide. Used to prepare the Aqua Hydrogenii Dioxidi.

Though almost insoluble in cold water, Barium Dioxide forms therewith a definite hydrate, and imparts thereto an alkaline reaction. It is decomposed by most of the mineral acids, producing the corresponding barium salts, and liberating Hydrogen Dioxide, H_2O_2, which remains in the solution for a considerable length of time, if the reaction has taken place in the cold, and if an excess of the acid is present. In this way is prepared the official Aqua Hydrogenii Dioxidi (Solution of Hydrogen Peroxide), for which see the title OXYGENIUM.

BELLADONNA, Deadly Nightshade.—The *Atropa Belladonna* is an herbaceous, perennial plant, of the nat. ord. Solanaceæ, having dark-purple, bell-shaped flowers, and glossy, purplish-black berries about the size of cherries. It is indigenous in the mountainous districts of Central and Southern Europe and Asia, and is cultivated in Europe and in the United States. It contains two alkaloids,—the official *Atropine* (see below), and *Belladonnine*, the latter being considered by many authorities as identical with Hyoscyamine, Daturine, and Duboisine. They exist in the plant in combination with *Malic Acid*. The plant also contains the usual vegetable constituents, as albumin, gums, etc., and a coloring principle named *Atrosin*. The official titles are as follows:—

Belladonnæ Folia, *Belladonna Leaves*,—ovate and tapering, brownish-green above, grayish-green below, of slight odor and bitter, disagreeable taste. Stramonium leaves are more wrinkled, Hyoscyamus leaves are more hairy. Dose, gr. j, gradually increased.

Belladonnæ Radix, *Belladonna Root*,—cylindrical, tapering, wrinkled pieces, ½ to 1 inch thick, nearly odorless, taste bitter and acrid. Dose, gr. j, cautiously increased.

Preparations of the Leaves.

Extractum Belladonnæ Foliorum Alcoholicum, *Alcoholic Extract of Belladonna Leaves.*—Dose, gr. $\frac{1}{10}$ to $\frac{1}{2}$.

Tinctura Belladonnæ Foliorum, *Tincture of Belladonna Leaves*,—15 per cent. Dose, ♏j–xxx.

Emplastrum Belladonnæ, *Belladonna Plaster*,—has of the above extract 20 per cent., mixed with Resin and Soap Plasters, of each 40 per cent. It may produce the physiological action of the drug.

Unguentum Belladonnæ, *Belladonna Ointment*,—has of the above extract 10, Diluted Alcohol 5, Benzoinated Lard 85.

Preparations of the Root.

Extractum Belladonnæ Radicis Fluidum, *Fluid Extract of Belladonna Root.*—Dose, ♏j–v.

Linimentum Belladonnæ, *Belladonna Liniment*,—has of Camphor 5, dissolved in Fluid Extract of Belladonna Root to 100.

Atropine and its Derivatives.

Atropina, *Atropine*, $C_{17}H_{23}NO_3$,—white, acicular crystals, odorless, of bitter taste and alkaline reaction; very soluble in alcohol and in chloroform, also in 130 of water at 59° F. Is decomposed by prolonged contact with caustic alkalies and is resolvable into *Tropin* and *Tropic Acid*.

Atropinæ Sulphas, *Atropine Sulphate*, $(C_{17}H_{23}NO_3)_2H_2SO_4$,—a white powder of bitter taste and neutral reaction, soluble in 0.4 of water and in 6.2 of alcohol at 59° F. Dose, gr. $\frac{1}{120}$–$\frac{1}{80}$.

Homatropina, *Homatropine*, $C_{16}H_{21}NO_3$ (Unofficial),—is a derivative alkaloid, obtained by the action of dilute HCl on Amygdalate of Tropin. The Hydrobromate is used by ophthalmologists as a mydriatic, its effects passing off much sooner than those of Atropine. Homatropine slows the heart, Atropine quickening it.

Tropeius (Unofficial),—is a result of the action of a mineral acid on Tropin.

PHYSIOLOGICAL ACTION.

Belladonna is an irritant narcotic, a mydriatic, an antispasmodic and an anodyne; in small doses a cardiac, respiratory and spinal stimulant; in large doses a paralyzer of the cardiac and respiratory centres, the spinal cord, the motor nerves and the involuntary muscles. It produces congestion and dryness of the mucous membrane of the throat, mouth, nose, and larynx, and at first lessens the gastric and intestinal secretions, but soon reproduces these in large quantity. The heart rate is at first slowed, but soon becomes very rapid and vigorous, the pulse being doubled in rapidity; the arterial tension being at the same time raised, the circulation is greatly increased. This is accomplished by stimulation of the cardiac sympathetic, and paralysis of the pneumogastric, thus stimulating the accelerator apparatus while lessening the inhibitory. [Digitalis increases both.] The vasomotor ganglia are stimulated all over the body, but are afterwards paralyzed by over-stimulation, the heart weakens, the vessels relax, and the blood-pressure becomes greatly reduced. Complete motor-paralysis follows, delirium, stupor, and finally death, which usually occurs by asphyxia.

The pupils are dilated by either the local or systemic use of the drug, which stimulates the end-organs of the sympathetic and paralyzes those of the motor oculi, thus increasing the power of the radiating iris fibers and lessening the action of its circular ones. Atropine applied locally also paralyzes accommodation and increases the intraocular pressure. The least quantity of atropine which will affect the pupil is stated at gr. $\frac{1}{10000}$ (Wood), gr. $\frac{1}{20000}$ (Roosa), gr. $\frac{1}{40000}$ (Ely), gr. $\frac{1}{128000}$ (Trousseau), gr. $\frac{1}{460000}$ (Loring), gr. $\frac{1}{700000}$ (Donders).

The brain is congested by Belladonna, headache, vertigo, busy delirium, and hallucinations being produced, the latter from a selective action on the cells of the gray matter. The spinal cord is stimulated from the 3d cervical vertebra to the 10th dorsal, resulting in complete motor paralysis, central and peripheral, power being lost first in the lower extremities. Sensation is also impaired somewhat, but the muscular irritability is not. Respiration is increased and the body-temperature elevated. Metamorphosis is greatly promoted by the increased activity of the circulation. A diffused eruption of scarlet color, closely resembling the eruption of scarlet fever, is often produced on the skin and fauces by Belladonna, with dysphagia and sore throat, and is sometimes followed by desquamation of the epidermis. It is due to capillary congestion caused by the greatly increased circulation.

Belladonna is rapidly diffused and quickly eliminated, particularly by the kidneys. The urine of an animal under the action of the drug will dilate the pupil of another animal. Herbivorous animals and birds are scarcely susceptible to it, and pigeons are not affected by it at all.

Atropine has the same actions as those above described, being the active principle of the plant. Belladonnine was long supposed to be inert, but has recently been shown to be identical with Hyoscyamine. It is a mydriatic when given internally, but not when used locally.

Antagonists, Antidotes, and Incompatibles.

Opium is the physiological antagonist to the effects of Belladonna on the cerebrum, pupil, heart, respiration, arterial tension and kidneys. *Physostigmine*, Aconite, Pilocarpine and Quinine are each antagonistic to some of its effects, *Muscarine*, to most of them. In poisoning by this drug, Tannic Acid and emetics should be used, then *Morphine*, Physostigmine or Pilocarpine for the nervous disturbance. Caustic alkalies decompose Atropine and are therefore incompatible with the preparations of Belladonna.

THERAPEUTICS.

Belladonna is one of the most valuable drugs in the Materia Medica, ranking with Aconite, Arsenic and Opium in efficacy and wide range of use. It is especially efficient in the pain of inflammation, particularly that of rheumatism, gout, neuralgia due to peripheral disturbance, sciatica, cancer and pelvic affections. In cerebral and spinal hyperemia, congestive headaches, encephalitis, meningitis and myelitis it proves one of the very best remedies. In erysipelas of superficial and non-vesicular character and when cerebral, it is really curative when locally and internally administered. Inflammations of the lungs, iris, bladder, kidneys and breasts are all amenable to it. In constipation from atony of the bowels it is remarkably effective, and in the enuresis of children it is equally so if used freely, 10 to 20 drops of the tincture thrice daily. In recent cystitis from chill, spasm of the urethra, bladder and sphincter ani, typhus and typhoid fevers, acute nasal catarrh, sore throat with fever, inflamed and swollen tonsils, in many skin diseases, in asthma and whooping-cough, epileptic and puerperal convulsions, spermatorrhea and seminal losses, Belladonna is often a highly useful agent. Its local application is efficiently used in ulcers of the rectum, anal fissure, abscesses, boils, carbuncles and other superficial inflammations. In scarlet fever it relieves many of the symptoms, and is especially indicated in this disease when the rash is imperfect, the pulse feeble and the condition one of adynamia. Its prophylactic power against scarlet fever is believed in by many of our best practitioners, though questioned by many others.

Atropine is used in poisoning by Opium, Physostigma, and Hydrocyanic Acid; in ptyalism from mercury, pregnancy, etc.; in the sweats of phthisis, in sudden cardiac failure, and by eye-surgeons to paralyze accommodation, dilate the pupil, contract the vessels, lessen pain, and diminish (?) intra-ocular tension. In opium-poisoning it should be given in very small doses, and repeated for effect, as most of the unsuccessful cases of its use in this connection were due to overdosing with the antagonist, superinducing belladonna-narcosis upon the opium-narcosis. In cases of heart-failure from Chloroform or Ether inhalation, the hypodermic injection of Atropine has, in the writer's hands, saved several lives when all other methods of resuscitation had failed. It is highly efficient in lead poisoning, if used in combination with Potassium Iodide; and has given the most satisfactory results as a hemostatic in profuse metrorrhagia after abortion, in metrorrhagia of obscure origin, and in phthisical hemoptysis.

BENZINUM, Benzin (*Petroleum Ether*),—is a purified distillate from American petroleum, and consists of a mixture of hydrocarbons, chiefly of the marsh-gas series (C_5H_{12}.C_6H_{14}, and homologous compounds). It is a transparent, colorless liquid, very diffusive, highly inflammable, insoluble in water, soluble in alcohol, ether, chloroform, benzol and fixed and volatile oils. Its sp. gr. is 0.670 to 0.675, and its boiling point 122° to 140° F. It should be carefully kept in well-stoppered bottles or tin cans, in a cool place, remote from lights or fire. Dose, gtt. v–x, on sugar or in mucilage.

Benzin taken internally in overdose is known to produce gastro-enteritis, and such a case is reported which terminated fatally. In the ordinary medicinal doses it does not produce either vomiting or diarrhea. Benzin-poisoning may be produced by its inhalation, which is becoming quite a practice among glove-cleaners, and alcoholics have been known to take to inhaling benzin in place of drinking spirits. It has been used with some success externally as a remedy for rheumatic pain, neuralgia, itch, and prurigo; and internally as a vermicide against tapeworm. In pharmacy it has many uses on account of its power as a solvent for oils, fats, resins, caoutchouc and some alkaloids. In the household it is used as a solvent application for removing grease from clothing.

BENZOINUM, Benzoin,—is a balsamic resin obtained from *Styrax Benzoin*, a tree of the nat. ord. Styraceæ, native in Sumatra and Siam, by incision of its bark. It occurs in agglutinated tears or a brown, mottled mass, is soluble in alcohol and solution of potassa, and is composed of *Resins* 80 per cent., *Benzoic Acid* 10 to 20 per cent., and a trace of *Volatile Oil*. Some varieties yield also *Cinnamic Acid*.

Adeps Benzoinatus, *Benzoinated Lard*,—is prepared by suspending the powdered Benzoin, tied up in coarse muslin, in melted Lard, in the proportion of 2 parts to 100, for 2 hours, then removing the residual benzoin, and occasionally stirring the lard as it cools. When intended for use in warm weather 5 per cent. or more of the lard should be replaced by White Wax.

Tinctura Benzoini, *Tincture of Benzoin*,—has of Benzoin 20 parts, Alcohol 100. Dose, ʒ ss–j.

Tinctura Benzoini Composita, *Compound Tincture of Benzoin* (*Friar's Balsam*),—has of Benzoin 12, Aloes 2, Styrax 8, Balsam of Tolu 4, Alcohol to 100. Dose, ʒ ss–ij.

Benzoic Acids and Salts.

Acidum Benzoicum, *Benzoic Acid*, $HC_7H_5O_2$,—occurs in light, feathery plates and needles, and is obtained from Benzoin by sublimation, or prepared artificially, chiefly from Toluol. It is soluble in 500 of water, and in 2 of alcohol at 59° F., but its solubility in water is aided by Borax, one part of each being soluble in 100 parts. It is a constituent of Tinctura Opii Camphorata. Dose, gr. x–xxv, in wafers.

Ammonii Benzoas, *Ammonium Benzoate*,—is soluble in 5 parts of water and in 28 of alcohol. Dose, gr. v–xxx.

Lithii Benzoas, *Lithium Benzoate*,—soluble in 4 parts of water and in 12 of alcohol. Dose, gr. v–xxx.

Sodii Benzoas, *Sodium Benzoate*,—is efflorescent on exposure to air, soluble in about 2 parts of water and in 45 of alcohol. Dose, gr. v–ʒj.

Physiological Action and Therapeutics.

nzoin is decidedly antiseptic and disinfectant, and when used exter-
is slightly stimulant to the vessels. Its action is due to its Ben-

zoic Acid, which taken internally produces slight epigastric heat, increases the pulse-rate, and stimulates the action of the skin, the salivary glands, and the bronchial mucous membrane. It is principally excreted by the kidneys, in part as hippuric acid by combination with glycocoll, and in part unchanged. It renders the urine acid and increases its quantity. It is irritant to the fauces, and the powder when inhaled excites sneezing and coughing.

Benzoin is principally used as a stimulant expectorant, especially in the chronic bronchitis of the aged, and by atomization in laryngeal affections. The compound tincture, ʒj to ℥j in a pint of boiling water, is a useful sedative inhalation for the irritation and cough of subacute laryngitis and tracheitis. It has also been used beneficially in chlorosis and some uterine disorders. The compound tincture is a good local application (1 part to 4 of glycerin and water) for sore nipples and chaps of the hands and lips. For use as a cosmetic, either tincture is mixed with 20 parts of water, and employed to remove freckles and for other skin affections, especially urticaria. The tinctures are excellent applications to foul-smelling wounds, and form the basis of all the proprietary preparations sold for that purpose.

Benzoic Acid and its salts are the only certain means we possess, by which to neutralize morbid alkalinity of the urine. In cystitis, with phosphatic deposits and alkaline urine, they are extremely valuable, acidulating the secretion, and stimulating and disinfecting the mucous surfaces involved. Phosphatic calculi are said to be dissolved by the long-continued use of Ammonium Benzoate.

Sodium Benzoate has been largely used as a substitute for the salicylates in the septic diseases, being equally antiseptic and antipyretic. Though slower in action, its effects are more permanent, and it is capable of being used in larger doses (ʒij–iij daily). In diphtheria and scarlet fever it has been highly efficient, and in acute rheumatism, typhoid and the malarial fevers it has rendered good service. In phthisis, its use by inhalation to the extent of $\frac{1}{1000}$ of the body-weight daily has seemed to be of value. It has also proved very efficient in whooping-cough.

Lithium Benzoate is intended for use in gout and the uric acid diathesis, with the object of forming the very soluble urate of lithium in the system, as also on the theory that, as benzoic acid is converted into hippuric acid at the expense of nitrogenous material which would otherwise become uric acid, the latter product will be lessened.

BENZOLUM, **Benzol**, *Benzene*, *Phenyl Hydride*, C_6H_6 (Unofficial),—is a constituent of coal-gas tar, obtained by distilling coal naphtha. It is a thin, colorless, oleaginous liquid, very inflammable, of agreeable odor, and sp. gr. 0.850. It is very diffusible, and the vapor, when inhaled, acts as an anesthetic. Dose, gtt. v–x, on sugar, in emulsion or capsules, up to ʒjss daily.

Benzol is a reliable pulmonary antiseptic, and has been used successfully in the treatment of whooping-cough, the vapor being diffused throughout the room, and proximity to a light or fire being carefully avoided. It has made quite a reputation in the treatment of influenza, and has been found effectual in destroying both head and body lice, for which purpose a single application is usually sufficient. It has also been given internally for the destruction of trichinæ, followed by a brisk laxative; and, mixed with lard, it is used externally in parasitic skin diseases, especially scabies, also in rheumatism and neuralgia.

BERBERIS, Barberry (Unofficial),—is the root of several species of the nat. ord. Berberidaceæ, the one generally used being the *Berberis aquifolium*, or Oregon grape, which grows on the Pacific slope of the United States. Its value is probably due to its alkaloid, *Berberine*, $C_{20}H_{17}NO_4$, a yellow, crystalline body, soluble in hot water and alcohol, but not in ether, which is found also in several other plants, as Hydrastis, Coptis, Podophyllum, Menispermum, Calumba, Xanthoxylum, etc.

Extractum Berberidis Fluidum, *Fl. Extr. of B.* (Unofficial),—Dose, ♏v–xxx.

Tinctura Berberidis, *Tincture of Berberis* (Unofficial),—1 to 5. Dose, ♏x–ʒj.

Berberina, *Berberine* (Unofficial),—Dose, gr. j–x. It usually occurs in commerce as *Hydrastin,* which is a Berberine Hydrochlorate prepared from Hydrastis.

Berberis is an astringent bitter, a tonic and stomachic in small doses, but in large doses it is cathartic, producing watery diarrhea with abdominal pain. It is also believed to possess considerable alterative powers. It has been successfully used as a local application in conjunctivitis, and internally as a remedy for intermittent, remittent and typhoid fevers, diarrhea and dyspepsia. As an alterative and tonic it is useful in syphilitic and strumous affections, and in pain, soreness and burning sensations along the biliary or urinary tracts with a tendency to gravel or gall-stones it will be found a useful remedy.

Berberine has some antiseptic and antiperiodic value, but in large doses is a gastro-intestinal irritant. The Hydrochlorate is a useful injection in gonorrhea, in which it acts by virtue of its antiseptic and astringent powers.

BERGAMOTTÆ OLEUM, Oil of Bergamot,—is a volatile oil extracted from the rind of the fresh fruit of *Citrus Bergamia*, an orange-tree of the nat. ord. Aurantiaceæ, native in Southern Europe. It is of greenish color, faintly acid, and is soluble in alcohol, glacial acetic acid and liquor potassæ. It contains several hydrocarbons of the formula $C_{10}H_{16}$, together with *Bergaptene* or Bergamot Camphor. It is an ingredient of Spiritus Odoratus, and is exclusively used as a perfume in the manufacture of toilet articles.

BISMUTHUM, Bismuth, Bi.—This metal is represented in medicine by four official salts and several unofficial ones, the most important of which are the following:—

Official Salts of Bismuth.

Bismuthi Citras, *Bismuth Citrate,* $BiC_6H_5O_7$,—a white, amorphous powder, odorless and tasteless, insoluble in water or alcohol, soluble in Water of Ammonia. Used only for pharmaceutical purposes.

Bismuthi et Ammonii Citras, *Bismuth and Ammonium Citrate,*—is a combination of the citrate with aqua ammoniæ, and has no definite chemical composition. Small, pearly scales, very soluble in water, sparingly in alcohol. Dose, gr. j–v.

Bismuthi Subcarbonas, *Bismuth Subcarbonate,*—a white or yellowish-white powder, of somewhat varying chemical composition, tasteless and odorless, insoluble in water or alcohol. Dose, gr. v–xxx, in powder or emulsion.

Bismuthi Subnitras, *Bismuth Subnitrate,*—a heavy, white powder, of somewhat varying chemical composition, odorless and almost tasteless, of slightly acid reaction; insoluble in alcohol, almost insoluble in water. Dose, gr. v–xxx, several times a day, in powder, pill, or milk; often combined with opium, morphine or belladonna.

Unofficial Bismuth Preparations.

Bismuthi Salicylas, *Bismuth Salicylate,*—exists in two forms, the acid salt and the basic salt, the latter being the one used therapeutically. It contains 76 per cent. of the oxide of bismuth, and 23 per cent. of salicylic acid; and occurs as a white, crystalline salt, almost entirely insoluble in water, alcohol or glycerin. It should give no reaction with perchloride of iron. Dose, gr. v–xx.

Bismuthi Subiodidum (Oxyiodidum), *Bismuth Subiodide*,—a brick-red, heavy, amorphous powder, insoluble in water, insoluble in any reagent without decomposition. Used locally as an antiseptic dusting powder, and internally in doses of gr. jss–iij.

Bismuthi Subgallas, *Bismuth Subgallate* (*Dermatol*),—a fine odorless, saffron-yellow powder, insoluble in all ordinary solvents. Dose, gr. v–xxx.

Bismuthi Oleas, *Bismuth Oleate*,—a pearly-gray, soft, bland substance. [See under Acidum Oleicum, *ante*, p. 103.]

Airol, *Bismuth Oxy-iodo-gallate*,—is a patented combination of Bismuth Subgallate and Iodine, occurring as a bulky, gray powder, odorless and tasteless, insoluble in water or alcohol. It is used as a dusting powder for ulcers and wounds, or mixed with Vaselin or Lanolin as an ointment.

Eudoxin, *Bismuth Tetra-iodo-phenol-phtalein*,—is a bismuth salt of Nosophen and contains about 53 per cent. of Iodine and 14 per cent. of Bismuth. It occurs as a reddish-brown, odorless and tasteless powder, insoluble in water. It is said to be an efficient internal antiseptic for gastric and intestinal affections. Dose, for children, gr. j–iij; for adults, gr. iij–viij.

Iodomuth,—is a proprietary bismuth preparation, said to contain 25 per cent. of Iodine, and occurs as a reddish-brown, impalpable powder, both odorless and tasteless. It is used locally as an alterative and stimulating antiseptic for ulcers, sores and wounds, also internally for gastro-enteritis, dysentery and cholera infantum. Dose, gr. j–x.

Orphol, *Bismuth Beta-naphtolate*,—contains from 50 to 70 per cent. of Bi_2O_3 also Beta-naphtol, and is a reddish-brown powder, insoluble in water, and recommended as an intestinal antiseptic and astringent. Dose, gr. v–xx, up to a daily quantity of gr. xv for children and gr. xlv for adults, given with honey or milk.

Xeroform, *Bismuth Tri-brom-phenol*,—is a patented preparation which contains about 50 per cent. of Bi_2O_3 and occurs as a yellow, insoluble powder, having a faint odor of carbolic acid. It is almost non-toxic and unirritating to mucous surfaces. It is an excellent surgical and intestinal antiseptic, and has been used locally with benefit in chancroids, buboes, foul ulcers, infected wounds, burns, eczema and other skin diseases. It has been given internally with satisfactory results in cholera, intestinal catarrh and the summer diarrhea of children, also for chronic urticaria and certain forms of infantile eczema. Dose, gr. vij–xv, three times a day.

Physiological Action and Therapeutics.

The action of the insoluble Bismuth salts is chiefly a local one, they being sedative to the end-organs of the nerves, though a minute quantity passes into the blood and acts as a tonic, promoting constructive metamorphosis by increasing the appetite and digestion. They are also feebly astringent, and produce constipation after a time, coloring the stools and tongue a dark clay color, from their conversion in part into the sulphide. Toxic effects when occurring are ascribed to Arsenic, with which the commercial preparations were formerly contaminated. Lately, however, it has been shown that Bismuth salts possess toxic powers of their own, and that the symptoms of bismuth-poisoning may develop when these preparations are applied as dressings to a large, denuded surface, or taken internally in large doses for a long period of time. A black line along the margins of the gums, headache, nausea, vomiting, pale face, elevated temperature, rapid pulse, edema of the lower extremities, diarrhea, and an odor of urine on the breath are some of the symptoms observed in such cases. Black and gangrenous sloughs may occur in the intestines, and the urine may contain albumin.

The insoluble Bismuth salts are used internally in many forms of disordered digestion, gastralgia, vomiting and diarrhea, especially in children, but large doses are necessary for efficiency. The best vehicle for them is milk. Locally they are used with advantage in acne rosacea, stomatitis, nursing sore mouth, eczema, intertrigo, ulcers, conjunctivitis, coryza, gonorrhea, gleet and leucorrhea. The Subnitrate is regarded by many practitioners as almost a specific in cholera infantum, given in hourly doses of 3 to 6 grains: also in the diarrhea of phthisis, in dysentery and intestinal ulceration, it is highly efficient, in doses of 15 grains every hour or two. Externally, it is employed as a dusting powder, either pure or mixed with starch (1 to 5); as a drying application for the nasal, pharyngeal and laryngeal mucous membranes; in suspension as an injection in gonorrhea (4 to 10 per cent.); and with vaselin (10 to 15 per cent.) as an ointment in eczema, also for burns and wounds.

The Bismuth and Ammonium Citrate being soluble, is more rapid in action, but also more astringent and irritant than the other salts, though it is probably precipitated in the stomach by the hydrochloric acid of the gastric juice. It is serviceable in diarrhea without irritation of the intestinal mucous membrane, but rather with relaxation thereof. The Salicylate (basic salt) when pure is well borne by the stomach, and can be used for longer periods than the subnitrate. It has been especially serviceable in the diarrhea of phthisis, in that of typhoid fever, and in chronic gastric and intestinal disorders also as an internal antiseptic in dilatation of the stomach.

The Subgallate, also known as *Dermatol*, is one of the many proprietary substitutes for Iodoform, and has been patented in this country. It has great stability, as well as valuable drying and bactericidal qualities, and is an excellent vulnerary for wounds and burns. It has proven useful in the treatment of moist eczema, ulcers, and other affections of the eye, diseases of the middle ear and dental caries. It occasionally produces dermatitis, and Dr. Cantrell holds that it is decidedly irritating, is a stimulant rather than an astringent, does not check but rather increases discharge, and does not fulfil the claims made for it. Efforts are made to show value for it as an internal remedy in fermentative dyspepsia and gastric catarrh. It is efficiently employed internally for diarrhea in doses of 20 or 30 grains every two or three hours.

The Oleate is credited with mildly astringent and emollient properties, having been used with benefit in pustular affections of the skin and in acne. The Subiodide is an exceedingly valuable agent in the treatment of burns, wounds, ulcers, and similar affections as a substitute for Iodoform. (See under IODUM.)

BOLDUS, Boldo (Unofficial),—the leaves and stems of *Peumus Boldus*, an evergreen shrub of the nat. ord. Monimiaceæ, found in Chili. It contains a volatile oil and a bitter alkaloid, *Boldine*. A tincture is made (1 to 5), of which the dose is ♏v–viij, gradually increased, but large doses have a somewhat narcotic effect, besides causing vomiting and purging.

Boldo is used in anemia, rheumatism, dyspepsia and general debility, also in catarrhal affections of the urinary passages, and as a substitute for Quinine. In France it is employed as a tonic, especially for cases with chronic torpor of the liver; and in South America it is much used in gonorrhea and in chronic cystitis.

BROMUM, Bromine, Br,—is a dark, brownish-red, volatile liquid, evolving an irritant vapor of peculiar and suffocating odor. It is soluble in 30 of water at 59° F., very soluble in alcohol, ether, chloroform and carbon disulphide; is a non-metallic element found in sea-water and in the mother-liquid of certain salt-works, usually in combination. On exposure to air or heat it is completely volatilized. It destroys the color of solutions of litmus and indigo, and imparts a yellow color to solution of starch. It is used only by inhalation and locally as an escharotic.

Bromides and their Preparations.

Potassii Bromidum, *Potassium Bromide*, KBr,—colorless, cubical crystals, soluble in 1.6 of water and in 200 of alcohol. Dose, gr. ij–ʒj, well diluted.

Sodii Bromidum, *Sodium Bromide*, $NaBr$,—colorless, monoclinic crystals, soluble in 1.2 of water and in 13 of alcohol. Dose, gr. ij–ʒj, well diluted.

Lithii Bromidum, *Lithium Bromide*, $LiBr$,—a white, granular, deliquescent salt, very soluble in water and in alcohol. Dose, gr. ij–xx, well diluted.

Ammonii Bromidum, *Ammonium Bromide*, NH_4Br,—colorless, prismatic crystals, soluble in 1.5 of water and in 30 of alcohol. Dose, gr. ij–xx, well diluted. This Bromide is well borne by children in comparatively large doses if epileptic from reflex causes. A child one year old can tolerate gr. v every 4 hours (Barton).

Calcii Bromidum, *Calcium Bromide*, $CaBr_2$,—a white, granular, deliquescent salt, very soluble in water and in alcohol. Dose, gr. ij–ʒj, well diluted.

Strontii Bromidum, *Strontium Bromide*, $SrBr_2(H_2O)_6$,—colorless, hexagonal crystals, very deliquescent, very soluble in water and in alcohol; insoluble in ether. Dose, gr. ij-xxx, well diluted.

Zinci Bromidum, *Zinc Bromide*, $ZnBr_2$,—a white, granular, deliquescent powder, very soluble in water and in alcohol. Dose, gr. ½–ij, well diluted.

Syrupus Ferri Bromidi, *Syrup of Iron Bromide* (Unofficial),—is a syrupy liquid containing 10 per cent. of Ferrous Bromine, $FeBr_2$, prepared by acting on Iron Wire 35 parts with Bromine 75, adding Sugar 600 and Water up to 1000 parts. A translucent, pale-green, odorless liquid of sweet, ferruginous taste and neutral reaction. Dose, ʒss–j.

Bromoformum, *Bromoform, Tri-bromo-methane*, $CHBr_3$, (Unofficial),—is prepared by the action of sodium hypobromite on acetone, or by the action of bromine upon a solution of equal parts of caustic potash and methyl alcohol. A clear and colorless liquid, of pleasant odor and sweet, agreeable taste; slightly soluble in water, readily soluble in alcohol and glycerin. Dose, ♏v–xx. If it has color it should be rejected as unsafe by reason of decomposition.

Acidum Hydrobromicum Dilutum, *Diluted Hydrobromic Acid*,—is composed of 10 per cent. of absolute Hydrobromic Acid (HBr), and 90 per cent. of water. It is a clear, colorless, and odorless liquid, of a pungent acid taste, produced by decomposing Potassium Bromide by Sulphuric Acid and distilling. Dose, ♏xx–ʒij.

Arsenic Bromide is described on page 199, **Aurum Bromide** on page 206, **Ethyl Bromide** on pages 113 and 116, and **Camphora Monobromata** under CAMPHORA.

PHYSIOLOGICAL ACTION.

Bromine is an active and very painful escharotic, a deodorant and an antiseptic, setting free ozone. Its vapor is highly irritant to the respiratory mucous membrane and the eyes, producing cough, hoarseness and dyspnea. Internally, it is an active, corrosive poison, causing violent gastritis, depression and collapse.

The Bromides are powerful depressants of the cerebral and spinal functions, also alterative, antispasmodic and hypnotic. The Potassium salt is a cardiac and muscular paralyzant. Bromides have a saline taste and are very diffusible, but slowly eliminated. They are decomposed in the blood, and re-formed at the points of elimination (fauces, bronchi, intestines, skin and kidneys), where they irritate the mucous membranes. Continued for some time, they produce severe gastric catarrh. They reduce the number of the respirations, and the heart's action and force; and though diminishing the calibre of the arterioles, they lower arterial tension. They lessen the activity of the brain cells, producing somnolence; and diminish the sensibility of the peripheral nerves, causing anesthesia of the skin and mucous membranes. They impair motility and the sexual function, cause great pallor and emaciation, lowered body-temperature, acne on the face and upper extremities, fetid breath, dysphagia, sluggish reflexes and defective coördination; and if long continued may even impair the mental faculties, producing hallucinations in some cases, in others melancholia with suicidal tendency; also incompetence of the sphincters and paralysis, beginning at the periphery and extending to the centres. They sometimes cause maniacal excitement, as in the case of a physician who committed suicide in a frenzy caused by bromidizing himself for sea-sickness.

The general result of their action is termed ***Bromism***, and is heralded by the acne and lowered faucial sensibility. It is probably due to the sedative influence of these agents on the sympathetic system, causing general anemia of the brain, spinal cord, sexual organs, and skin. It is believed that a previous prolonged use of opium or morphine renders the organism extremely susceptible to the action of the bromides.

Dr. Hammond mentions several cases of fatal bromide-poisoning in one of the last chapters of his treatise on Nervous Diseases, and several cases of poisoning by Potassium Bromide have been published by Dr. Greenless. The first was that of an epileptic who took 75 grains a day for three weeks, when stupor, coma, and extreme prostration and death followed. The *post mortem* showed intense congestion of the meninges. In another case, an epileptic, the same amount of potassium bromide, 75 grains a day, was given, and in ten days coma and death followed. Both the brain and meninges were congested and the kidneys were in the advanced stage of cirrhosis. The other cases were less prominent and clearly resulted from bromism due to long use of the drug. In some cases of inebriety large doses of bromides produce stupor and prostration, from which recovery is slow, and is followed by continued prostration.

The action of Hydrobromic Acid on the nervous system and circulation is identical with that of the Bromides. Added to a mixture of quinine and water (♏ij to each grain of quinine) it will produce a clear solution.

Differences in Action between the ordinary Bromides.

Potassium Bromide is the most toxic to the heart and the muscular system, and is the least hypnotic. It contains 66 per cent. of Bromine.

Sodium Bromide is the least toxic, but the most hypnotic, and acts more energetically on the circulation. It contains 78 per cent. of Bromine.

Ammonium Bromide resembles the Potassium salt in action, except that it exerts less influence on the heart and on the muscular system, and is somewhat more stimulating.

Lithium Bromide contains the most Bromine, 92 per cent., and resembles the sodium salt in action. It has proved better than the others in some cases of epilepsy, and is by several authorities considered the best hypnotic of the series.

Calcium Bromide is an efficient hypnotic, but otherwise much less active than the other bromides.

Strontium Bromide is said to be less apt than the other bromides to produce the bromic acne and the other results of bromism.

Zinc Bromide, in large doses, is violently irritant. It is supposed to combine the tonic effects of zinc with the sedative action of the bromides.

Ferrous Bromide is not official. It is supposed to combine the actions of iron and the bromides, and to produce the effects of a sedative chalybeate tonic. It is not an eligible chalybeate.

Antagonists and Incompatibles.

Vaso-motor stimulants, as Digitalis, Ergot, Belladonna, antagonize many of the effects of the Bromides, but *Morphine* is the most efficient antagonist, especially for the mental symptoms. Nitrous Ether is incompatible with the Bromide of Ammonium, and Acids and metallic salts are so with all the Bromides.

THERAPEUTICS.

The Bromides are used as sedatives to the nervous system, to lower reflex activity, to produce sleep, to subdue excitement of the genital apparatus, and to antagonize congestion of the brain. Their use in epilepsy is that of a specific, but therein they are terribly abused, by patients, nurses, and even by physicians. They should not be used in anemic conditions, and never for any length of time without the daily supervision of a physician. If Opium be administered in ascending doses for four to six weeks before commencing a course of treatment by bromides, the latter will be much more effective in smaller doses than otherwise. The mixture of Potassium Bromide and Chloral is very unsafe in cases where fatty or weak heart exists, both drugs being active cardiac depressants. In convulsive and spasmodic affections, the bromides are very efficient, and in epilepsy, especially when the seizures are diurnal, the sodium salt is used with great advantage over a long period, in sufficient quantity to maintain anesthesia of the fauces. It requires occasional purgation to prevent its accumulation, and arsenic to combat the acne. In diabetes of nervous origin, the ammonium salt, long used, has proved curative by its sedative influence on the medulla; and in acute rheumatism it is an excellent alkali. In muscular rheumatism, rheumatic arthritis and myalgia, also in the uric acid diathesis and various affections due to undeveloped gout, the lithium salt gives good results. In tetanus and strychnine-poisoning the potassium salt, in large doses, is antagonistic. These agents are generally efficient in nervous erethism, insomnia with congestion, infantile colic, cholera infantum, vomiting of cerebral origin, cardiac irritability when not due to anemia, in delirium tremens, melancholia, whooping-cough and other reflex coughs, seminal losses when plethora exists, and nymphomania. The potassium salt is, by some writers, considered almost specific in subinvolution of the womb, also in uterine hemorrhage not due to a mechanical cause.

Strontium Bromide has been favorably known for some time for its beneficial action in gastric affections, particularly in dyspepsia, acetic and lactic fermentation, flatulence from decomposition and vomiting of various origin, including the vomiting of pregnancy. In severe cases of the latter affection it proved entirely successful, administered in doses of gr. xv with meals, twice daily for a month. In epilepsy it has been employed with advantage, in doses of gr. xx thrice daily, gradually increased: and it has been used in the treatment of nervous and sick headaches, seasickness, insomnia and other conditions for which the bromides are considered suitable. It is said to be less productive of the bromic acne than any other bromides in general use.

The Syrup of Iron Bromide has been reported by some observers as very efficient in chorea, and its usefulness therein is as strenuously denied by others.

In hysteria, congestive headaches, neuralgia, and nervous exhaustion, Hydrobromic Acid has been found useful. Used as a solvent of Quinine it retards Cinchonism, and prevents the headache resulting from the full action of Quinine and Iron. As a substitute for the Bromides of Sodium and Potassium it is highly recommended, being much less depressant. It has been especially recommended in tinnitus aurium. Fothergill used it for coughs of a reflex or spasmodic nature, also for simple continued fever where there is cerebral disturbance.

Bromine is not much used. Its vapor may be inhaled from hot water in acute coryza, hay-asthma, etc., and for chancre and hospital gangrene and is the best escharotic. In diphtheria and membranous croup, a solution of ♏viij to the ℥, used internally, and inhalation of the vapor, have been used successfully in the most severe cases.

Bromoform is an analogue of Chloroform, and was discovered in 1832 by Löwig. Inhaled, it produces anesthesia on animals, but of shorter duration than that of ether or chloroform. Deep narcosis has been produced in children by overdoses taken internally; the little patients having been tempted, by the pleasant taste of the medicine, to the surreptitious ingestion of more than was prescribed. It has proven of special efficacy in whooping-cough, administered in daily doses of 5 to 20 minims in glycerin and alcoholic solution. It aborts the paroxysms of coughing and reduces their number somewhat, but has little influence otherwise on the regular course of the affection. Increasing doses must not be pushed very far for fear of toxic symptoms, and the drug must be absolutely colorless if pure. Inhalations of Bromoform have been used with some success in the treatment of diphtheria, and it has been employed locally with benefit, as a deodorizer, disinfectant and analgesic, in ozena and in tuberculous and other ulcers of the larynx.

BRYONIA, Bryonia, *Bryony*,—is the root of *Bryonia alba* and of *Bryonia dioica*, European perennial plants of the nat. ord. Cucurbitaceæ. Its taste is acrid and bitter, but it is inodorous. The active principle is the glucoside *Bryonin*, $C_{48}H_{80}O_{19}$, which is intensely bitter, and soluble in water and in alcohol, but insoluble in ether. Dose, of the powdered root, gr. x–xxx.

Preparations.

Tinctura Bryoniæ, *Tincture of Bryonia*,—a 10 per cent. solution of the root in alcohol. Dose, ♏v–℥ss.

Bryonin (Unofficial),—is a violent poison in doses of from 3 to 4 grains. Dose, as a drastic purgative, gr. 1/6–1/3.

Physiological Action and Therapeutics.

Bryonia is a pure irritant, setting up local inflammation wherever applied, with febrile phenomena. It has a vesicant action on the skin, and is violently irritant to the serous and mucous membranes. Taken internally, it has caused fatal gastritis; introduced into the pleura, fatal pleuritis has resulted with fibrinous effusion. It has a specific determination to serous and synovial membranes, especially the pleuræ, and is also irritant to muscular fibre and to the bronchial mucous membrane, causing dry, continuous, shaking cough, with soreness behind the sternum. It produces cerebral congestion, with frontal headache, vertigo and epistaxis; also hepatic and renal congestion, burning pain and tenderness in the hepatic region with bilious disturbance amounting sometimes to severe jaundice, vesical tenesmus, and depression of the action of the heart. It is a drastic purgative and a powerful diuretic.

Bryonia is a very old medicine, its most ancient reputation having been in epilepsy, hysteria and mania, conditions in which it is now superseded by other agents. It is a most valuable drug in the second stage of serous inflammations, after Aconite has reduced the pyrexia, especially in pleurisy, pleuro-pneumonia and pericarditis, to limit the extent of the effusion and to promote its absorption. For this purpose small doses frequently repeated are required. Also, in rheumatic fever, after the swelling of the joints has been reduced by other means, Bryonia is extremely efficient for the pain and stiffness. It is one of the best remedies for a "cold-on-the-chest," with dry, shaking cough, soreness, or shooting pains. It has been used with success in common, continued or "gastric" fever, relapsing fever, congestive headaches increased by stooping, bilious headache with vomiting, gastralgia with pyrosis and soreness of the epigastrium, constipation, cholera infantum during dry, hot weather, congestion of the liver, croup, and threatened mammitis. Pains of shooting or tearing character, increased by movement, are often quickly relieved by this drug. In dropsies it is used as a drastic purgative and diuretic to remove the accumulated fluid.

BUCHU, Buchu,—is the leaves of *Barosma betulina*, *B. crenulata* and *B. serratifolia*, S. African shrubs of the nat. order Rutaceæ. They contain a *Volatile Oil*, which is probably the active principle, and gives them a peculiar and penetrating odor, resembling that of peppermint; also *Barosmin*, a bitter extractive, and resin, gum, lignin, etc. Dose, of the leaves, gr. xv–xxx.

Preparations.

Extractum Buchu Fluidum, *Fluid Extract of Buchu*,—Dose, ♏x–ʒj.
Infusum Buchu, *Infusion of Buchu* (Unofficial),—℥j to the pint. Dose, ℥ss–ij.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Buchu in small doses causes a sense of heat in the stomach, which is gradually diffused over the body. It increases the pulse-rate, stimulates the appetite, and produces slight moisture of the skin. It increases the flow of urine, which becomes of darker color and strongly aromatic odor, and deposits a brownish sediment. In large doses it produces vomiting, purging and strangury, with a burning sensation at the stomach.

Buchu is of especial value in chronic affections of the genito-urinary mucous membrane, on which the volatile oil acts topically, being eliminated by the kidneys. It is a very useful remedy in pyelitis, cystitis and urethritis; also in lithiasis, in chronic bronchitis, and in affections of the prostate gland. It is recommended in atonic dyspepsia, chronic rheumatism and affections of the skin, also for dropsy, but it is not so actively diuretic as to be very efficient in the latter condition.

The Infusion makes an excellent vehicle for saline diuretics.

CACTUS GRANDIFLORA, or *Night-blooming Cereus* (Unofficial),—is a native of tropical America, and has long had a local reputation as a remedy for dropsy, but was brought into notice as a cardiac remedy by Dr. Rudini. Its active principle, *Cactine*, a supposed alkaloid, has been physiologically studied by Dr. Myers, who finds it possessed of very decided stimulant action upon the heart, the arterial tension and the spinal motor centres. Therapeutically, this drug has been employed as a cardiac stimulant in the functional disorders of the heart connected with anemia, neurasthenia, dyspepsia, tobacco-poisoning, exophthalmos, sexual exhaustion and low fevers, also in pseudo angina pectoris. It does not prolong the diastole, as Digitalis does, and on this account it has been especially recommended in complicated aortic regurgitation. A tincture is prepared of the strength of ℥iv of the fresh stems to a pint of strong alcohol, the dose of which is ♏xx–xxx every 4 hours.

Pellotine, $C_{13}H_{19}NO_3$ (Unofficial),—is an alkaloid obtained from *Anhalonium Williamsii*, a member of the cactus family growing in Mexico. This alkaloid is a powerful hypnotic and also somewhat analgesic, though not possessing the pain-relieving power of morphine. It has the advantage of being capable of hypodermic administration, and has given relief to the pains of locomotor ataxia and peripheral neuritis. The dose is about gr. j for an adult. *Mezcaline*, another alkaloid from the same plant, seems to be the cause of the exaltation produced by drinking the fermented liquor Mezcal prepared therefrom.

MIUM, Cd (Unofficial).—This metal was official in the Pharmacopœia of 1870,
longer so. In its physiological action it resembles both Antimony and Zinc,
harotic, astringent, and a very depressant emetic. In over-doses its salts act as

irritant poisons, with cerebro-spinal symptoms, such as coma and convulsions. It is never used internally. Its salts in general use are—

Cadmii Sulphas, *Cadmium Sulphate* (Unofficial),—transparent oblique prisms, efflorescent, and very soluble in water. Used externally in a solution of gr. ss–iv ad ℥j aq. destil., or as an ointment (1 to 40 of fresh lard).

Cadmii Iodidum, *Cadmium Iodide* (Unofficial),—large, white, pearly crystals, soluble in water and alcohol. Used as an ointment, 1 to 8 of lard.

The Sulphate has been used almost exclusively as a stimulating astringent in gonorrhea and diseases of the eye. Corneal opacities are absorbed under the use of a solution of gr. ij to the ℥, and in gonorrhea a mild injection (gr. ¼ ad ℥j) is very beneficial. An ointment of the Iodide has been usefully employed for enlarged glands, chronic joint affections, cutaneous diseases, nodes and chilblains.

CAFFEA, Coffee, the seed of *Coffea Arabica,* is officially represented only by its active principle, *Caffeine.* The coffee-plant is a small tree of the nat. ord. Rubiaceæ, 15 to 30 feet high, native of South Arabia and Abyssinia, but cultivated in various parts of the world. Its seeds contain the alkaloid *Caffeine* (partly free, partly as a tannate), also tannic and caffeic acids, sugar, legumin, etc. By roasting them, part of the caffeic acid is converted into methylamin, the sugar is changed into caramel, and several volatile substances are formed, which give to coffee its peculiar aroma and some of its stimulant qualities, and are collectively known as *Caffeone,* one of them being called *Caffeol.*

Caffeina, *Caffeine, Tri-methyl-xanthin,* $C_8H_{10}N_4O_2+H_2O$. The U. S. Pharmacopœia of 1890 defines Caffeine (Theine) as "a feebly basic, proximate principle, obtained from the dry leaves of *Thea Sinensis,* . . . or from the dried seeds of *Coffea Arabica,* . . . and found also in other plants." In the edition of 1880, *Guarana* was included by name among its sources. Therefore, the principles named Caffeine and Theine are now officially declared to be identical, and their identity with Guaranine is left unsettled. That all three are identical was the general opinion until recently, their composition being expressed by the formula $C_8H_{10}N_4O_2$, and the physiological action of one being accepted for the others. Some investigators, however, doubt the identity of the first two, and some observers maintain that Guaranine also is a separate body, distinct from either of the others. The Caffeine of commerce is usually obtained from old tea leaves, and is in reality Theine. It contains more nitrogen than almost any other proximate vegetable principle. It occurs in colorless, flexible, silky crystals, which are soluble in 80 of water and in 33 of alcohol at 59° F. Dose, gr. j–v.

Theine is contained in the leaves of *Thea Sinensis,* the tea-plant, a native of China and Japan, and a member of the nat. ord. Ternstromiaceæ. The tea-plant also contains much Tannic Acid, and a volatile oil, the latter being most abundant in green teas. Theine is found on the market, Merck's being considered the most reliable. Its solubility in water is much increased by adding an equal part of Sodium Benzoate, say ʒj of each to the fluid ℥, with gr. x of Sodium Chloride. Of this, ♏vj equals gr. ½ of Theine. Dose, gr. ⅙–j, hypodermically, several times a day, for relief of pain.

Preparations.

Caffeina Citrata, *Citrated Caffeine*,—is a very uncertain mixture, and is not considered to be a definite compound. It is prepared by dissolving equal weights of Caffeine and Citric Acid in double the quantity of hot distilled water, evaporating the solution to dryness and powdering the product, which is white, odorless, of acid taste and acid reaction, soluble in about 3 parts of water, precipitated as Caffeine on further dilution with water, and redissolved with about 25 parts of water. Dose, gr. ij–x.

Caffeina Citrate Effervescens, *Effervescent Citrated Caffeine*,—composed of Caffeine 1, Citric Acid 1, Sodium Bicarbonate 33, Tartaric Acid 30, Sugar 35, triturated, mixed with Alcohol to a paste, dried and powdered. Dose, ʒj–ij, in a glassful of water, as an effervescing drink.

Extractum Caffeæ Viridis Fluidum (Squibb), *Fluid Extract of Green Coffee* (Unofficial),—is intended as a substitute for the fluid Extract of Guarana. Dose, ʒss–ij. [Compare the title GUARANA.]

PHYSIOLOGICAL ACTION.

Coffee is a cerebro-spinal stimulant, a stomachic tonic, and a laxative. It is decidedly diuretic, and is somewhat antiperiodic and highly antiseptic. The green bean produces effects very different from those of the roasted one, exhibiting the action of Caffeine alone, unmodified by that of the empyreumatic products. A tincture of green coffee, besides being an efficient diuretic, has marked anti-lithic powers, and promotes the elimination of the poison of gout from the system.

As a beverage, if used with moderation Coffee assists digestion, promotes intestinal peristalsis, allays the senses of fatigue and hunger, lessens tissue-waste and consequently decreases the formation and excretion of urea (?). Used to excess it disorders digestion, and causes functional disturbances of the nervous system, shown by headache, vertigo, mental confusion, and palpitation of the heart. It increases secretion, blunts sensation, exalts reflex excitability, increases mental activity, and may produce insomnia and great nervous restlessness. It first briefly stimulates the heart and raises arterial tension, but soon depresses both. The wakefulness is usually preceded by a brief period of drowsiness.

The brief stimulation of the intellect, consequent on drinking a cup of good coffee, cannot be obtained from an infusion of raw coffee, and is probably due to the volatile constituents developed in roasting. *Caffeone* opposes Caffeine in its action on the circulation, as it quickens the pulse and lowers arterial tension. Its action, however, is of brief duration, and soon gives way to the influence of the principal constituent. The *Tannin* is the ingredient which enables it to produce dyspepsia, and is most abundant in those infusions which are kept a long time on the stove before being served.

THE COMMON STIMULANT BEVERAGES COMPARED.

ties possessed in common by these substances, and for whic
iversally esteemed by mankind, are three-fold. They

retard the retrograde metamorphosis of the body-tissues (tissue-waste), thereby enabling the work of the individual to be done upon a smaller supply of reparative material (food), and with less fatigue. Furthermore, when used in moderation, they are more or less stimulating to the mental processes, and sedative to the nervous system.

This similarity of action they owe to the possession of principles, which, if not identical, are so closely related to each other that until very recently they have been so considered both by chemists and pharmacologists. The divergence from each other, in the finer shades of their action, depends most probably on the existence in each of differing aromatic and volatile principles, which modify the action of the alkaloid in some degree. Similar principles are developed in them by the various processes of preparation (as roasting, drying, etc.), all of which have some part in determining the general action of the beverages containing them.

Coffee (*Coffea Arabica*, nat. ord. Rubiaceæ), is more stimulating than Coca and less sustaining. It is apt to cause severe palpitation of the heart in some persons, and may disorder the digestion if long infused before ingestion. The coffee-bean contains only from 0.2 to 0.8 per cent. of caffeine.

Tea (*Thea sinensis*, nat. ord. Ternstromiaceæ), is one of the most refreshing and stimulating members of the group. Used to excess, it powerfully affects the stability of the motor and the vaso-motor nerves, the action of the heart, and the digestive function, producing flatulent dyspepsia, tremulousness of the limbs, pallor of the surface, irregular cardiac action and feeble impulse, hallucinations, nightmare, anorexia, headache, nausea and vomiting, obstinate neuralgiæ, especially of the supra-orbital and occipital nerves; also constipation and a pain in the left side are not infrequent. The condition of chronic tea-poisoning is termed *Theism*, and is very often seen among women of the lower class in cities, who do not indulge in alcoholic beverages, but freely accept the dominion of the "cup that cheers" and worse than inebriates. Tea contains much more Tannin than coffee, and that used as a beverage by the poorer classes is little more than a decoction of tannin, and a fruitful source of dyspepsia and other forms of gastric disorder.

Maté (*Ilex Paraguayensis*, nat. ord. Aquifoliaceæ), is supposed to be intermediate as to its effects between tea and coffee. It contains Theobromine as well as Caffeine, the latter in the proportion of 1.2 per cent., also a little tannin.

Guarana (*Paullinia Cupana* of Brazil, nat. ord. Sapindaceæ), contains an alkaloid—*Guaranine*, in the proportion of 5 per cent., which is probably identical with Caffeine, though some think it more nearly analogous to Theine. It is especially noted for relieving a nervous headache, for which purpose the official fluid extract may be used in doses of ♏xx, three or four times daily, when the basis of that preparation happens to be of good quality. [Compare the article on GUARANA.]

Coca, or Cuca (*Erythroxylon Coca,* nat. ord. Lineæ), is probably more sustaining than either tea or coffee and less of a direct stimulant, at least as used by the Peruvian natives. Its habitual and excessive use produces a very serious train of nervous symptoms. [Compare the article entitled COCA.] Its alkaloid, *Cocaine,* is allied in action to Caffeine, but is more powerful, and its proportion in the leaves of the plant varies greatly in the different samples which occur in commerce.

Cocoa (*Theobroma Cacao,* the Chocolate-tree, nat. order Sterculiaceæ), pronounced *Ko-ko,*—is more nutritious than any other of the group, containing a large quantity of fat, *Oleum Theobromatis* (cacao-butter), which makes it difficult of digestion to many persons. Its alkaloid, *Theobromine,* is chemically a *Dimethylxanthin,* and is closely allied to Caffeine, the latter being considered a Methyl-theobromine. The various preparations of this agent are made from the seeds, after the oil has been expressed from them. They are ground in a mill, mixed with rice, barley, sugar, flour, etc., and put up in powdered form, called *Cocoa,*—but when flavored with vanilla and pressed into a cake the product is named *Chocolate.* The thin husks which envelop the seeds are known as *Shells,* and are used to make a beverage similar to but milder than cocoa or chocolate. [Compare the article entitled THEOBROMATIS OLEUM.]

Kola (*Cola acuminata,* nat. ord. Sterculiaceæ), is the nut or seed of the Kola plant, a handsome tree growing 30 to 60 feet high in the tropical forests of Africa and in the West Indies. It contains both *Caffeine* and *Theobromine,* the former in larger proportion than any member of the group except Guarana; also *Tannic Acid* and a glucoside substance named *Kolanin,* which, in the presence of a ferment, splits up into free caffeine and glucose, its yield of caffeine being 3 per cent. The Kola nut is highly valued by the negroes as a stimulant beverage and food and as an aphrodisiac, the latter quality being ascribed to the essential oil, which is not present in the dried nuts. It improves the appetite and the digestion, and promotes cheerfulness of the spirits and inclination to exertion. It is becoming a fashionable stimulant under the commercial methods which are employed in pushing the sale of the various preparations on the market.

PHYSIOLOGICAL ACTION OF CAFFEINE.

Caffeine is in general terms at first a stimulant and subsequently a paralyzant to the nerve-centres in the cerebrum, medulla and cord. In small doses it quickens the action of the heart and raises arterial tension; stimulates the cerebral functions, by increasing the supply of blood to the brain; and increases the respiration rate and the secretion of urine. Larger doses (gr. v–viij) often over-stimulate the cerebral circulation, [illegible] great heaviness of the head, flashes of light before the eyes, tinni- [illegible] insomnia, restlessness, and even delirium, the pulse becoming rapid, feeble, irregular and intermittent, and the general body-temperature elevated, though that of the periphery may be lowered. Large doses depress the heart and respiration, and lower the blood-pressure; in the smaller animals it exalts the reflex excitability of the cord, producing tetanic convulsions, and in lethal doses paralyzing the cardiac muscle as well as its motor ganglia, but causing death by paralysis of respiration. It powerfully affects muscular fibre, both voluntary and involuntary kinds, throwing it into a state of tetanic contraction resembling rigor mortis. Caffeine is a reliable hydragogue diuretic, acting by stimulation of the secreting apparatus in the kidney, as well as by generally raising the arterial tension (Brunton). The action of caffeine on the kidneys is two-fold; during the first stage it causes a fall of general blood-pressure and constriction of the renal vessels; during the second stage, which persists much longer than the first, the blood-pressure returns to its normal height and the kidney undergoes great expansion (Murrell). If administered in sufficient quantity it would doubtless prove fatal to man, but its lethal dose for him would be large. Zenetz has recently published the details of three cases of sudden death during the use of full doses of caffeine, in all of which the heart was found at the autopsy to be so firmly contracted that it was cut with difficulty. He infers therefrom that caffeine may cause sudden arrest of the heart in systole.

Caffeine is excreted as such very slightly and slowly by the kidneys. In its passage through the body it largely loses its methyl groups, most of it being transformed into xanthin which probably breaks up into urea.

Theine, according to Dr. Mays, agrees in most respects with Caffeine in its action upon small animals, except that it requires much larger doses to produce the same effects. It differs from caffeine in some important particulars. Theine chiefly affects the sensory, Caffeine the motor system. Theine causes spasms and convulsions and impairs the nasal reflex, early in the course of the poisoning process; while Caffeine does so late, if at all. Theine decreases the body-temperature,—Caffeine increases it. Theine causes convulsions in frogs, a power now denied to Caffeine, though hitherto ascribed to it. Both alkaloids tend to produce muscular contraction, but Theine causes a peculiar rhythmical contraction in voluntary muscles, which lasts for several hours, and seems to act transversely across the fibre, as the muscle is elongated at each contraction. In man, the principal action of the hypodermic injection of Theine is the production of a profound local anesthesia at and below the point of injection, acting therefore outwards along the nerve-trunk, and not towards the centre. It does not affect the motor apparatus, nor does it seem to produce narcosis.

Guaranine is generally considered to be identical with Caffeine, though some few observers find in its action a closer analogy to Theine. It affects both sensory and motor nerves, the sensory first, paralyzing them from the centres outwards. [*Cocaine* and *Brucine* act from the periphery inwards.] It causes general hyperesthesia, and subsequently convulsions of spinal origin,—at first increases and afterwards depresses respiration and the action of the heart. It seems to have a stronger affinity for the sensory than for the motor nerves, and hence resembles Theine more than Caffeine.

Theobromine has the formula $C_7H_8N_4O_2$, and is closely allied to Caffeine, both physiologically and chemically. In fact, Caffeine may be considered a Methyl-theobromine, $C_7H_7(CH_3)N_4O_2$. During roasting the cocoa-bean develops an aromatic principle which gives to chocolate its peculiar flavor. In large doses Theobromine is fatal to small animals.

THERAPEUTICS.

Although without a very extensive range of usefulness, Caffeine is a valuable stimulant in many forms of nervous and cardiac depression, and has proved especially efficacious in headaches of neuralgic or nervous type, the pain being general over the head; gr. j of Caffeine every half hour, or the fluid extract of Guarana, in 20-minim doses every 2 or 3 hours. In choleraic diarrhea, and that of phthisis, it checks outward osmosis by stimulating the depressed nervous apparatus. In cervico-brachial neuralgia, Caffeine may be used hypodermically in doses of gr. j, increased to gr. v. In lithemia and gout, a tincture of the green bean has marked diuretic and antispasmodic powers, and is very useful in these conditions. In the insomnia of chronic alcoholism gr. ½ of Caffeine hypodermically is often efficient. For adynamic fevers, it may well be used in place of alcoholic stimulants. In intermittents Coffee has a curative reputation among the inhabitants of the Philippines, which is corroborated by the Dutch physicians. In asthma, Coffee is valuable for the paroxysm if not used habitually. In opium narcosis, Caffeine hypodermically, or better still, strong black coffee by the mouth, will antagonize the increasing torpor of the nervous centres.

Although Caffeine is an efficient diuretic in cardiac and renal dropsies, there are many objections to its use for this purpose. It sometimes acts as a purgative as well as a diuretic, and although at first it produces copious diuresis, tolerance is soon established and it loses its diuretic power. Moreover, it is a powerful cardiac stimulant, and in many persons it exerts a very marked excitant action upon the central nervous system. Lastly, and as a minor disqualification, it sometimes sets up considerable smarting in the penis and produces a mild form of urethritis (Murrell). Its tendency to produce tetanic contraction of muscular tissue and its possible influence to arrest the heart in systole should be kept in mind when it is being administered for any prolonged period.

Caffeine is contained in many proprietary preparations of which Acetanilid is the active ingredient (see page 77). Its office therein is that of a corrigent, to antagonize the depressant action of the latter drug upon the heart. A double citrate of caffeine and antipyrin, named *Migranin* is described on page 171.

Theine, according to Dr. Mays, is a valuable analgesic, especially so by reason of its prolonged influence over sensation. Its great field of employment is in neuralgia of any kind, in which doses of gr. ⅙ to gr. ½ hypodermically are efficient, and may be kept up as long as required. To make a cure, however, the nutrition of the nerves must be attended to. In locomotor ataxia and lumbago it has been used with prompt benefit, in the same manner, quickly relieving pain without producing any effect.

Kola is a useful agent in gastric catarrh and in the dyspepsia of alcoholic subjects, as an adjunct to other treatment. After an alcoholic debauch it will do much in restoring the nervous system to its normal condition. It will counteract the depressing effects of tobacco, and has been employed with benefit in asthma of both the nervous and cardiac forms. As it contains a good deal of tannin, it is especially efficient in atonic diarrhea, and in gastro-intestinal irritation with looseness of the bowels, a restricted diet and Kola-wine are frequently all that is needed. As an aphrodisiac it deserves high rank, though it acts in this respect not so much by stimulating the sexual appetite as by enabling the organism to escape the sense of exhaustion and extreme debility which neurotic patients are apt to complain of (Woodbury).

Sodio-Theobromine Salicylate, *Diuretin* (Unofficial),—was introduced under the latter title as a proprietary preparation. It occurs as a colorless powder, of sweetish, saline and alkaline taste, soluble in ½ its weight of water, and should contain 46½ per cent. of Theobromine. Being a very unstable compound, it should not be prescribed in combination with other drugs, and when dispensed it should be well sealed from contact with the air, from which it rapidly absorbs carbonic acid, thereby undergoing decomposition. If ordered under its chemical name the cost should be less than ½ that of the same article under its proprietary title (Squibb). Dose, gr. x–xv, in powder or aqueous solution, several times a day, as a diuretic.

Diuretin was introduced as a soluble preparation of Theobromine, of value for its prompt diuretic action, influencing the kidneys without causing serious or dangerous results upon the heart, the action of which, however, it strengthens and regulates. Given to healthy persons it does not increase the quantity of the urine, but during its administration in morbid conditions of the renal or cardiac apparatus the volume of urine increases three- and four-fold, and exudations of non-inflammatory character are rapidly absorbed. It may give rise to slight diarrhea, and the author has found the body-temperature uniformly subnormal in non-febrile patients while under its influence.

Diuretin has been employed with marked benefit in both cardiac and renal dropsy, in hepatic cirrhosis, and in various diseases of the heart and kidneys accompanied by edema. The author has seen a large pleuritic effusion disappear rapidly under its use, the fluid having re-accumulated after having been once removed by tapping the pleural cavity. It should be administered in aqueous solution, avoiding acids or acid vegetable juices, which are chemically incompatible, as they precipitate the alkaloid in the form of a thick white sediment.

CAJUPUTI OLEUM, Oil of Cajuput,—is a volatile oil distilled from the leaves of *Melaleuca Leucadendron*, a tree of the nat. ord. Myrtaceæ, native of the Molucca Islands. It is a bluish-green or colorless liquid, of camphoraceous odor and neutral reaction, freely soluble in alcohol. It contains *Cajuputol* or Bihydrate of Cajuputene, which forms ⅔ of it, the other ⅓ being another oil. Dose, ♏j–v.

Cajuput Oil resembles Oil of Turpentine, and has similar action to that of the other volatile oils, being a stimulant carminative, somewhat diuretic and diaphoretic, antiseptic, parasiticide and anthelmintic. Externally used it is irritant to the skin. Swallowed, it produces a sense of warmth in the stomach and accelerates the pulse.

It is not much used internally, though it has been given with benefit in flatulent colic, dropsy, hysteria, chronic rheumatism, scrofula, and syphilis, also in elephantiasis and other cutaneous disorders. Externally, as a strong, stimulating rubefacient, it is efficient in chilblains, muscular rheumatism and nervous headaches.

CALAMUS, Sweet Flag,—is the rhizome of *Acorus Calamus*, a plant of the nat. ord. Araceæ, native in Europe and North America, having an aromatic odor and pungent taste. Only the unpeeled root should be used, peeled or bleached calamus being almost inert. It contains a volatile oil and *Acorin*, which is a nitrogenous, bitter principle, also benzoic acid, starch, etc. Dose, indefinite.

Extractum Calami Fluidum, *Fluid Extract of Calamus*,—is made with Alcohol as a menstruum. Dose, ♏xv–ʒj.

Calamus is an aromatic bitter, and a stomachic tonic, increasing the appetite and stimulating digestion. It is one of the constituents of the preparations termed "bitters," and is chewed as an appetizer.

CALCIUM, Ca,—is the metal characteristic of Lime, Chalk, and all calcareous substances, and although itself unofficial it is represented by several official salts and preparations. Lime (*Calx*) and Chalk (*Creta*) are respectively the Oxide (CaO) and the Carbonate ($CaCO_3$) of Calcium, the carbonate occurring in the native forms called chalk, marble, limestone, oyster-shells, etc., which are converted into lime by heating to full redness (calcination), thereby driving off carbonic acid and leaving the oxide behind. The latter, in this form, is known as "burnt lime" or "quicklime"; and, by the addition of ½ to ¾ its weight of water, combines with one molecule of H_2O to form *Calcium Hydrate*, $Ca(HO)_2$, or "slaked lime," the process being termed "slaking" and being accompanied by the evolution of a high degree of heat.

Lime is one of the four alkaline earths, the other three being Baryta, Magnesia, and Strontia. As such, however, it never occurs naturally, though in combination with various acids it is found in all the three kingdoms of nature; its base, the metal Calcium, being a widely distributed element, forming the basis of all calcareous and cretaceous substances. Besides the forms mentioned above, Calcium occurs as a *sulphate* (gypsum), also as a *phosphate* in bones, shells and various organic tissues, and as a *silicate* and a *fluoride* in certain minerals and vegetables.

Official Salts of Calcium.

Calx, *Lime*, *Calcium Oxide*, CaO,—is Lime prepared by burning white marble, oyster-shells, or the purest varieties of native Calcium Carbonate. Occurs in hard, white masses, gradually resolving to a white powder in the air, odorless, of sharp, caustic taste and alkaline reaction, soluble in 750 of water and 1300 of boiling water, insoluble in alcohol. Not used internally except in solution. Is a constituent of Potassa cum Calce.

Calcii Hydras, *Calcium Hydrate*, *Slaked Lime*, $Ca(HO)_2$,—official in the Br. Phar.; is prepared by pouring 1 pint of water over 2 pounds of Lime in a metal pot. It should be recently prepared and kept excluded from the air. It is sparingly soluble in water (gr. xj in Oj) and less soluble in hot water, but its solubility is greatly increased by the addition of sugar.

Calcii Carbonas Præcipitatus, *Precipitated Calcium Carbonate*, $CaCO_3$,—a fine impalpable, white powder, odorless and tasteless, insoluble in water or alcohol, but soluble in mineral acids or acetic acid with effervescence. Creta (chalk) is native Calcium Carbonate. (See next page.) Dose, gr. v–ʒj.

Calcii Chloridum, *Calcium Chloride*, $CaCl_2$,—hard, colorless masses, deliquescent, of sharp, saline taste, soluble in 1½ of water and in 8 of alcohol. Dose, gr. iij–x in solution. This salt should not be confounded with Chlorinated Lime.

Calcii Sulphas Exsiccatus, *Dried Calcium Sulphate*, *Dried Gypsum*,—contains about 5 per cent. of water. A fine, white powder, without odor or taste, insoluble in alcohol, soluble in 410 of water at 59° F., in 388 of water at 100° F., and in 476 of water at 212° F. Used in the preparation of Calx Sulphurata.

Calcii Sulphidum, *Calcium Sulphide*, is described under SULPHUR; **Calcii Bromidum**, *Calcium Bromide*, under BROMUM; **Calcii Hypophosphis**, *Calcium Hypopho* [illegible] **hosphas Præcipitatus**, *Precipitated Calcium Phosphate*, under

Preparations of the Oxide. (Lime.)

Liquor Calcis, *Solution of Lime, Lime-water,*—contains about 0.17 per cent. of Calcium Hydrate, $Ca(HO)_2$. A clear, colorless liquid, of saline taste and alkaline reaction. Dose, ℥ss–iv.

Syrupus Calcis, *Syrup of Lime, Saccharated Solution of Lime,*—contains 6½ per cent. of Lime, and 40 of Sugar, the latter aiding the solvent power. Dose, ♏x–ʒj. Is an antidote to poisoning by Carbolic or Oxalic Acid.

Linimentum Calcis, *Lime Liniment, Carron Oil,*—contains equal volumes of Lime-water and Linseed Oil, mixed by agitation. For local use.

Calx Chlorata, *Chlorinated Lime,* is described under CHLORUM; **Potassa cum Calce,** *Potassa with Lime,* under POTASSIUM, and **Calx Sulphurata,** *Sulphurated Lime,* under SULPHUR.

Preparations of the Carbonate. (Chalk.)

Creta Præparata, *Prepared Chalk,* $CaCO_3$,—is native Calcium Carbonate, freed from most of its impurities by elutriation; a white, amorphous powder, odorless and tasteless, insoluble in water or alcohol. Dose, gr. x–ʒj. It is a constituent of Hydrargyrum cum Creta, and also of the following:

Pulvis Cretæ Compositus, *Compound Chalk Powder,*—has of Prepared Chalk 30, Acacia 20, Sugar 50 parts. Dose, gr. v–ʒj.

Mistura Cretæ, *Chalk Mixture,*—has of the preceding 20 parts, Cinnamon Water 40, Water to 100, rubbed together and made fresh as required. Dose, ʒss–ij.

Trochisci Cretæ, *Troches of Chalk,*—each contains of Prepared Chalk 4 grains, Acacia 1, Sugar 6, with a little Nutmeg. Dose, indefinite.

Testa Præparata, *Prepared Oyster-shell* (Unofficial),—contains animal matter intimately mixed with the Carbonate of Calcium. Dose, gr. x–xx or more.

Allied Substances.

Substances allied to Chalk, and derived from the animal kingdom, are—*Crabs'-eyes,* which are concretions obtained from the stomach of the craw-fish, *Coral, Cuttle-fish Bone, Egg-shell* and *Oyster-shells* (Testa, see above); all of which are mainly composed of Calcium Carbonate, but also contain the phosphate and sulphate of calcium and other metallic salts in small quantity, as well as organic material. In the past special virtues have been ascribed to these substances, and even now some authorities maintain that the animal carbonates derange the stomach less than the mineral ones, and are to be preferred for infants and delicate persons.

Physiological Action.

Lime, in its unslaked form (quick-lime), has a great affinity for water and readily combines with sulphur, thereby decomposing and destroying organic matter. Upon the skin its action is irritant and superficially caustic, but more severe on the mucous membranes, and if inhaled or swallowed it may produce dangerous local inflammation, followed by ulceration. In weak solution it has an astringent and sedative effect both locally and internally, and acts as an absorbent and an antacid. Chalk possesses the astringent and antacid qualities of lime without its irritant properties.

Calcium Chloride is a very diffusible salt, and in small doses has remarkably alterative action, being apparently a powerful antagonist to the condition known as the strumous diathesis. Full doses produce symptoms of muscular poisoning similar to those caused by potassium salts, with lowered temperature, slowed pulse, and a tendency to cardiac paralysis. In large doses it is an irritant poison. It increases the amount of the urine and probably promotes the excretion of urea. It has a great affinity for water, and is used in pharmacy to abstract water from other substances, as in the preparation of absolute alcohol and ether. In solution it is used as a test for tartrates, citrates and oxalates.

Calcium Salts play an important part in the circulation and in most of the other functions of the body. The heart or any other muscle, deprived of calcium, will no longer contract. These salts have a remarkable influence on the nutrition of plants and animals, the Phosphate being as essential to the nourishment of the organs of locomotion (cartilage, bone, tendon and muscle) as iron is to the blood or phosphorus to the nerve tissue. They possess high coagulating power on the blood; their deficiency gives rise to lymphatic and osseous disease, and their absence results in emaciation and finally death. They are excreted almost entirely by the intestines, a very small portion being absorbed and but little of that passes out by the kidneys. Their absence from water renders the latter flat and insipid to the taste, but if present in excess (above 20 grains of the carbonate to the gallon) the water containing them is believed to be one of the factors of goitre. The Sulphate, in even so small a proportion as 6 grains to the gallon, is unwholesome, as it is liable to irritate the bowels and produce constipation and diarrhea alternately, according as its astringent or irritant effect predominates.

Antidotes, Antagonists and Incompatibles.

In poisoning by Caustic Lime the antidotes are a dilute *Vegetable Acid* or Lemon-juice or Carbonated Water freely, followed by demulcents or fixed oils to protect the mucous membranes. *Opium* or Alcohol as an antagonist against the vital depression. Potassium salts and Calcium salts are mutually antagonistic. Poisoning by Calcium Chloride is treated by *Albumin*, mucilaginous drinks, oils, milk, flour and water, but no acids.

Incompatible with preparations of Lime and Chalk are all the *Acids* and metallic salts, especially the *Sulphates* and *Tartar Emetic;* and borates, alkaline carbonates and astringent vegetable infusions are also incompatible with the preparations of Lime.

THERAPEUTICS.

Lime may be used as a caustic and depilatory, but is better known as an agent for hastening decomposition, which it does by its great affinity for water, the resulting hydrate absorbing many of the products. The Chlorinated Lime is an excellent antiseptic and disinfectant, but as it owes its energy entirely to its power of evolving chlorine it will be described under the title Chlorum. Lime-water is a favorite remedy for vomiting, especially in children, and is added to milk to increase its digestibility. A mixture of milk and lime-water will be retained by the stomach when no other food can be borne. Lime-water is an efficient agent in psia, mucous enteritis and typhoid fever, as an astringent and antacid. Locally, it is well employed as an enema against thread-worms, as a mouth wash for aphthæ, and as a lotion for cracked nipples, eczematous eruptions, and many mucous and purulent discharges. For such purposes it may be mixed with oil or glycerin, and if a few drops of carbolic acid be added the efficacy of the mixture is much increased. The Liniment is best known by the name *Carron Oil,* from the foundries at Carron, where it is extensively used. It is one of the best applications for burns and scalds, and makes a good dressing for the face in small-pox, and for cases of eczema affecting a large area of the skin. The vapor of slaking lime, or lime-water in the form of spray, have been usefully employed as inhalations in diphtheria. Lime-water is a good injection into the bladder in vesical calculus, in which its benefit is probably due to its astringent and soothing effects on the inflamed vesical mucous membrane, blunting its sensibility, and preventing the further growth of the stone by neutralizing the free acid of the urine.

One of the curiosities of medical history is the fact that in 1739 the British Parliament gave the sum of £5,000 to Mrs. Johanna Stephens for divulging the nature of a certain lithontriptic remedy. This, she stated, consisted of calcined egg-shells and soap, with various aromatic bitters, a combination which had previously been recommended by Barbette for the same purpose. The nauseousness of this compound suggested to Whytt the use of lime-water as a substitute, and the latter was found to be efficacious in many instances.

The Syrup contains more lime in solution than lime-water does, and may be used instead of the latter when a strong preparation is indicated. It is one of the antidotes in poisoning by carbolic and oxalic acids, while lime in any form (wall-plaster, whiting, etc.) is the best antidote for any mineral acid.

Chalk is the basis of all dentifrices, and may be used as a dusting-powder on ulcers, burns and excoriations of the skin. Chalk-mixture is a common remedy for diarrhea, and is usually employed in combination with other astringents, also with opium and aromatics. It is particularly serviceable for the diarrheas of children with sour-smelling stools and other symptoms of gastro-intestinal acidity.

Calcium Chloride is used with benefit as an internal remedy in the various manifestations of the strumous diathesis. It often causes the resolution of glandular enlargements, and the calcification of tubercular deposits, aids the cicatrization of ulcerating cavities, and has proved curative in eczema and lupus. It is highly praised in phthisis, also in chorea, and for the colliquative diarrhea of strumous children. In solution used as a fomentation it is said to hasten the maturation of boils.

The therapeutics of the other salts and combinations of calcium are described under the titles of their more active ingredients, Bromum, Chlorum, Phosphorus and Sulphur.

CALENDULA, Marigold,—is the florets of *Calendula officinalis*, the common Garden Marigold, a plant of the nat. ord. Compositæ, frequently cultivated for ornament. The tincture (20 per cent.) is also official, and is exclusively used as a local application to promote the healing process in wounds, ulcers, burns and other breaches of tissue. Extravagant views of its powers as a vulnerary are promulgated by the so-called "homeopathic surgeons," and serve as one of their excuses for professing an exclusive position in the art of surgery.

CALUMBA, Columbo,—is the root of *Jateorhiza palmata*, a plant of the nat. ord. Menispermaceæ, native in southeastern Africa, but cultivated in the East Indian Islands. It contains the alkaloid *Berberine* (see under BERBERIS, *ante*, page 218), a bitter principle named *Calumbin*, also Calumbic Acid and Starch, but no Tannin. Dose, gr. v–xxx.

Preparations.

Extractum Calumbæ Fluidum, *Fluid Extract of Calumba.*—Dose, ♏v–xxx.
Tinctura Calumbæ, *Tincture of Calumba,*—1 in 10. Dose, ʒss–ij.

Calumba is the first in alphabetical order of the simple bitters, having no astringency or aroma, and its action, as herein described, will apply to other members of that class (Quassia, Gentian, Cornus). It stimulates the nerves of taste, increases the flow of saliva, excites the flow of the gastric juice and the gastric circulation, thus increasing the appetite and aiding digestion, and thereby promoting the constructive metamorphosis. As it also increases the gastric mucus, its continued use will set up catarrh of the stomach and interferes with digestion, though it is one of the least irritant of stomachic tonics.

As Calumba contains no tannin, it may be administered with the salts of iron, and is often prescribed with the sub-carbonate. It is useful in atonic dyspepsia with pain after eating, in the convalescent stage of disease to promote appetite and digestion, in diarrhea and dysentery, vomiting, sea-sickness, cholera morbus and cholera infantum. An Infusion of Calumba with Ginger and Senna is effective in flatulence, and the same preparation is a good vehicle for the administration of acids and alkalies, tonics, aromatics, and mild cathartics. Having little or no irritant quality, it is an excellent tonic in the hectic fever of phthisis.

CAMBOGIA, Gamboge,—is a gum-resin, obtained from *Garcinia Hanburii*, a Siamese tree of the nat. ord. Guttiferæ. It contains 73 per cent. of *Gambogic Acid*, a resinous substance, also 25 per cent. of gum and 2 of water. It is partly soluble in alcohol and ether. The only official preparation is the Pil. Catharticæ Co. (described under COLOCYNTHIS), each pill containing gr. ¼ of Gamboge. Its dose, as a cathartic, is gr. ij–v,—as a diuretic, gr. j at short intervals.

Gamboge is an irritant purgative, decidedly diuretic, and its powder is sternutatory. Its catharsis is accompanied by vomiting and colic, and the stools produced are watery, but not so much so as generally believed. It has no cholagogue action. Full doses are ble to produce violent gastro-enteritis, and incautiously used (as in Morrison's pills) it frequently caused death. On the other hand, large doses have been given continu-ly in some cases, without producing any dangerous symptoms.

Gamboge was formerly much used as a hydragogue cathartic and diuretic in dropsies, but its irritant qualities have caused it to be superseded by other agents (elaterium, digitalis, etc.). However, for dysentery, especially when in young subjects, very small doses (gr. 1/16) at short intervals, up to gr. ¾ in 24 hours, have proven to be remarkably efficacious.

CAMPHORA, Camphor, $C_{10}H_{16}O$,—is officially described as a stearopten (having the nature of a ketone), obtained from *Cinnamomum Camphora*, a tree of the nat. ord. Laurineæ, and purified by sublimation. It occurs in white, translucent, waxy masses, of penetrating odor and pungent taste, lighter than water, in which it is sparingly soluble (1 to 1300), but dissolves readily in alcohol, ether, chloroform, benzin, oils, etc. The camphor-tree is indigenous to China, Japan, Formosa and other parts of Eastern Asia. Borneo-camphor has the formula $C_{10}H_{18}O$, bears the same relation to Japanese camphor as alcohol bears to aldehyde, and is heavier than water. Dose, gr. j–xx.

Derivatives of Camphor are—*Camphor-cymol*, which is obtained by its distillation with zinc chloride; *Camphoric and Camphretic Acids*, which result respectively from its lesser or greater oxidation; and *Safrol*, also contained in Sassafras oil, but obtained in much larger quantities from Camphor oil, a waste by-product in the manufacture of crude camphor.

Official Preparations.

Aqua Camphoræ, *Camphor-water*,—Camphor 8, Alcohol 5, Distilled Water to 1000. Used externally or as a vehicle internally. Dose, ʒj–iv.

Spiritus Camphoræ, *Spirit of Camphor*,—10 per cent. in Alcohol. Dose, ♏v–xx.

Linimentum Camphoræ, *Camphor Liniment*,—Camphor 20, Cotton-seed Oil 80.

Ceratum Camphoræ, *Camphor Cerate*,—has of the Liniment 10, White Wax 30, Lard 60. Used for itching skin-affections.

Camphora Monobromata, *Monobromated Camphor*, $C_{10}H_{15}BrO$,—colorless, prismatic needles or scales, of mild camphoraceous odor and taste, and neutral reaction; almost insoluble in water, slightly in glycerin, freely in alcohol, ether, oils, etc. Dose, gr. j–x, in emulsion.

Camphor is also an ingredient of Linimentum Saponis, Linimentum Sinapis Compositum, and Tinctura Opii Camphorata.

Unofficial Preparations.

Acidum Camphoricum, *Camphoric Acid*, $C_8H_{14}(COOH)_2$,—is a dibasic acid, obtained by the action of nitric acid on camphor. Occurs in white, acicular, odorless crystals, of feebly acid taste; insoluble, or nearly so, in cold water, readily soluble in hot water, alcohol, ether and fatty oils. Dose, gr. x–xxx, dry on the tongue.

Rubini's Tincture of Camphor,—is a saturated solution in alcohol, ℥j in ℥j¼, of which the dose is from 4 to 10 drops. ♏vij have caused toxic symptoms in an adult.

Raspail's "Eau Sedative,"—contains Aq. Ammoniæ ℥ij, Sodii Chloridum ℥ij, Camphorated Spirit of Wine ʒiij, Water Oij. Used externally.

Camphora Carbolata is a name given to a mixture of 2½ parts of camphor with one each of carbolic acid and alcohol. This preparation, mixed with olive oil, is a good non-irritating and antiseptic dressing for wounds and breaches of surface.

Camphor-Chloral is a fluid obtained by triturating together equal parts of camphor and chloral hydrate. It dissolves morphine sulphate readily (gr. xx in ʒij), also many other salts of alkaloids. It is often a serviceable application in superficial neuralgia, and is said to allay spasmodic cough if painted over the larynx.

Camphora Salicylata is obtained by heating together 11 parts of salicylic acid and 14 of camphor. An ointment prepared therefrom has been used with satisfactory results in the treatment of phagedena, spreading syphilitic sores, epithelioma, lupus, etc.

Oleum Camphorata, *Camphorated Oil,*—strength 10 per cent., is used for hypodermic injection, in doses of ♏xv–ʒj.

PHYSIOLOGICAL ACTION.

Camphor is antispasmodic, anodyne, antiseptic, diaphoretic, a stimulant expectorant, a cerebral excitant, a gastro-intestinal irritant, and a rubefacient. It has an acrid, hot taste, and irritates the skin and mucous membranes, in quantity exciting severe gastric inflammation with all the effects of an irritant poison. In medicinal doses it stimulates the vaso-motor system and the cardiac motor ganglia, and lessens the influence of the pneumogastric,—thus increasing the circulation and raising arterial tension. It also stimulates respiration and mental activity, even producing intoxication; promotes diaphoresis, allays pain, and increases the menstrual flow and the sexual appetite, but its continued use depresses the generative function. "Camphora per nares castrat odore mares."

Large doses cause gastro-intestinal inflammation, depress the heart and lower arterial tension, diminish the reflex function of the spinal cord, produce coldness of the surface, insensibility, coma, convulsions and perhaps death. As many as 200 grains have been taken without fatal result, yet 6 or 7 grains have produced extreme drowsiness and weakness of the pulse, and 20 grains laid up an Alpine guide for a day. It is eliminated by the bronchial mucous membrane, skin and kidneys, and has often caused dysuria.

Monobromated Camphor resembles the bromides, but its action is not identical with theirs. In mammals it produces muscular weakness passing into paralysis, lowered temperature and respiration, stupor and death. In some cases its use by man has been followed by epileptiform convulsions. It is a nervous sedative and hypnotic, and a gastric irritant.

Antagonists, Antidotes and Incompatibles.

Arterial sedatives, coffee, cold, etc., antagonize its action. Water precipitates it from the alcoholic solution, alkalies and earthy salts precipitate even the small quantity which is soluble in water. *Emetics* to remove as much as possible. *Opium* and *Bromides* for the convulsions.

THERAPEUTICS.

Camphor was much used by the older physicians as an antispasmodic, and is greatly valued still in China and Japan. It has a reputation for uncertainty of therapeutic action, but is usefully administered in cholera and choleraic diarrhea, summer diarrhea and that of infants, vomiting, gastralgia, cardiac depression, nervousness and nervous headache, nymphomania, capillary bronchitis, typhoid and eruptive fevers, dysmenorrhea, afterpains, chordee, strangury, and catarrhal colds. Locally it is effective in myalgia, lumbago, toothache, gangrene, and other conditions where counter-irritation or a local anodyne is required. A solution in ether has been found to be a beneficial application in erysipelas.

Subcutaneous injections of camphor dissolved in oil have been employed with excellent results in the collapse of pneumonia and in other conditions where collapse is imminent. In fibrinous pneumonia these injections produce a depression of about one degree in the temperature, and greatly ameliorate the general condition. They are also employed with benefit in the treatment of phthisis during the period of softening, rendering the patient more comfortable and prolonging life. Camphor administered in this manner is not well borne by young children, even in minimum doses.

Monobromated Camphor is used as a nerve sedative and hypnotic, but is not particularly efficient. It has been employed with advantage in whooping-cough, neuralgia, chorea, hysteria, delirium tremens and epilepsy, but it is taken with difficulty and is liable to irritate the stomach.

Camphoric Acid, in solutions of ½ to 6 per cent. strength, has been used with benefit as a topical agent in cystitis, also in coryza, acute bronchitis and other affections of the respiratory tract. Internally administered it gives good results as an intestinal disinfectant, and has lately come into prominence as one of the most efficient agents against sweating from various causes, especially the profuse night-sweats of pulmonary tuberculosis. For this purpose it is best administered dry on the tongue, in dose of 10 to 30 grains, not more than two hours before the time for the expected sweating to occur, as it is quickly and abundantly eliminated by the urine.

CANNABIS INDICA, Indian Cannabis, *Indian Hemp*,—is the flowering tops of the female plant of *Cannabis sativa*, grown in the East Indies; a coarse, pubescent, somewhat viscid annual of the nat. ord. Urticaceæ. Its odor is peculiar and narcotic, its taste slightly acrid.

Cannabis Americana, *American Cannabis*, (Unofficial),—is the same plant, *Cannabis sativa*, grown in the Southern States.

The two varieties are specifically identical with each other, differing only in the degree of their action, that grown in India being the most powerful. They contain a resin named *Cannabin*, and a *Volatile Oil*, from the latter of which are obtained *Cannabene*, a light hydrocarbon, and *Cannabene Hydride*, a crystalline body. Cannabis should not be confounded with the so-called "Indian or Canadian Hemp," APOCYNUM CANNABINUM (see *ante*, page 185).

Preparations.

Extractum Cannabis Indicæ, *Extract of Indian Cannabis*.—Dose, gr. ¼–j, if active. Hering's English Extract is one of the best.

Extractum Cannabis Indicæ Fluidum, *Fluid Extract of Indian Cannabis*,—is an alcoholic preparation which in mixtures must be thoroughly emulsified with Acacia, otherwise the resinous drug will separate and float to the top or adhere to the sides of the bottle. The Dose is put at ♏j–v or x, but the author has frequently administered ʒj of a good fluid extract without untoward results. Whatever may be the reason, it is a fact which he has often verified, that if the precipitate, formed when the alcoholic preparation is added to water, be of a brownish hue, a dirty, yellow-brown, the sample will prove to be almost inert;—but if of a decided olive-green color, the preparation will be active. The activity will be found to increase almost in direct proportion to the decided green color of the precipitate. Samples from one manufacturer show this difference, often seen between two bottles in the same shipment. The active principle seems to be intimately connected with the chlorophyll or other coloring matter present, and to be destroyed therewith by whatever injures the latter.

Tinctura Cannabis Indicæ, *Tincture of Indian Cannabis*,—strength 15 per cent. Dose, ♏xx–ʒj. The above remark on mixtures containing the fluid extract applies also to those containing the tincture of this drug.

Similar preparations of *Cannabis Americana* are made by the manufacturers and may be used in larger quantities. The dosage of all preparations of hemp is uncertain, as specimens of the plant vary greatly in activity. The best rule is to begin with a small dose, gradually testing the activity of the drug and the susceptibility of the patient by cautiously increased doses.

Cannabin Tannate (Unofficial),—is a yellowish-brown permanent powder, insoluble in water and ether, slightly soluble in alcohol, having a not unpleasant odor and a bitterish, astringent taste. No formula has been published for it, but it is claimed to be the tannate of a glucoside by Merck, of Darmstadt, who placed it on the market. Dose, as a hypnotic, gr. v–x.

Preparations used in the East.

Churrus is an impure resin, prepared by rubbing the leaves of the plant together and scraping off the adhering resin.

Gunjah is the dried leaf and tops as sold in the bazaars for smoking purposes.

Hashish, Bhang or **Siddhi** is a confection consisting of the leaves and small stalks coarsely broken and mixed with fruits and aromatics. It is employed in the preparation of various electuaries and beverages, and is also smoked with or without tobacco.

PHYSIOLOGICAL ACTION.

Cannabis Indica is antispasmodic, analgesic, anesthetic and narcotic, a cerebro-spinal stimulant and a powerful aphrodisiac. It increases intellectual and motor activity, stimulates the vaso-motor nerves, raising arterial tension, depresses sensation, and strengthens the energy of the uterine muscular fibre, but has no power to initiate uterine contractions. In large doses it causes a peculiar but generally pleasant form of intoxication, during which the particular traits of the individual are exaggerated, and the ideas follow each other so rapidly as to produce a sense of great prolongation of time, minutes seeming as if hours or even days. With this occurs increased sexual desire and uterine activity, also sensations of double consciousness and enormous dimensions. The sight and hearing are exalted, pupils dilated, anesthesia sets in, the reflexes are lowered by stimulation of inhibition (Setschenow's centre?), and if the dose be a heavy one a cataleptic state is induced. Sleep or coma follows according to the size of the dose, but death has never been produced by this drug.

After-effects are dullness, heaviness, vertigo, headache, confused thought, anesthesia of the skin, and marked diuresis,—but no nausea, no vital depression, no constipation. Repeated use of the drug causes mental weakness and impotence, the result of over-stimulation. A ravenous appetite is usually one of its effects.

Antagonists and Incompatibles.

Strychnine and Faradism are antagonistic. *Caustic Alkalies* are incompatible. In poisoning by it the stomach should be evacuated, stimulants given cautiously, and respiration maintained. The effects of a large dose last over 24 hours. *Lemon-juice* is said to antagonize its effects.

THERAPEUTICS.

Cannabis Indica was formerly much employed as an anodyne and hypnotic, also as an anesthetic during surgical operations. It is now somewhat out of fashion. In migraine it is useful to prevent recurrence of the attack, and in neuralgia it is often very efficient. Uterine affections, such as chronic metritis, subinvolution, menorrhagia and dysmenorrhea, are greatly benefited by its anodyne quality and its power over the uterine muscular fibre. It is one of the best hypnotics in delirium tremens, and in traumatic tetanus and paralysis agitans large doses of this drug will lower the reflex activity. Dysuria and retention of urine are often relieved by it, while in spasm of the bladder and other painful affections of that organ it will be found a most efficient remedy. It is useful in functional impotence, especially if combined with Ergot and Nux-vomica. In gonorrhea it lessens the discharge, relieves the inflammation, burning pain and restlessness, and allays chordee. The tincture of Cannabis Americana is the most useful in this affection, being fully as efficient as copaiba or sandal oil, and much more agreeable. It should, however, be prepared from the fresh plant, and be given in 3 to 5 drop doses 3 or 4 times daily after the subsidence of the acute symptoms. Full doses of the tincture of the Indian plant are extremely efficient in many cases of headache at the menopause, but should be used cautiously until the activity of the sample and the susceptibility of the patient are tested.

Dr. Lees has called attention to the fact that aqueous preparations of this drug, which contain but little of the resin, are much used by the natives of India for intoxicating and stimulating purposes, which indicates that the volatile oil and not the resin is the active principle. He uses a strong aqueous extract, prepared without heat, which gives all the beneficial effects of the alcoholic preparations without the extreme exhilaration bordering on intoxication so often produced by even medium doses of the latter. He finds that, in pulmonary affections generally, this *Liquor Cannabis Indicæ* acts most favorably as an anodyne and hypnotic, while in phthisis pulmonalis it relieves the cough and aids the patient by its stimulant and exhilarating qualities to a degree which no other drug can accomplish. Dr. Lees has also used it in indigestion with constipation, and in many affections of children in which nervous symptoms are prominent it has done good service. The adult dose is ʒss–j.

Cannabin Tannate is considered by Fronmüller to be a very useful hypnotic, not in any degree dangerous and neither disturbing the secretions nor leaving unpleasant after-effects. It has been used with benefit in acute mania.

CANTHARIS, Cantharides, *Spanish Flies,*—is the dried beetle, *Cantharis vesicatoria,* an insect of the nat. ord. Coleoptera, about an inch long, of a shining green color, the powder being grayish-brown with green particles, odor very disagreeable. Contains *Cantharidin,* $C_{10}H_{12}O_4$, the active principle; also a greenish volatile oil and peculiar fatty bodies.

Preparations.

Tinctura Cantharidis, *Tincture of Cantharides,*—5 per cent. Dose, ♏j–xx.

Ceratum Cantharidis, *Cantharides Cerate, Blistering Cerate,*—Cantharides 32, Yellow Wax, Resin, Lard, of each 18, Oil of Turpentine 15.

Collodium Cantharidatum, *Cantharidal Collodion, Blistering Collodion,*—Cantharides 60, Flexible Collodion 85, Chloroform to 100.

Emplastrum Picis Cantharidatum, *Cantharidal Pitch Plaster, Warming Plaster,* has of Cerate of Cantharides 8 parts, Burgundy Pitch to 100.

PHYSIOLOGICAL ACTION.

Cantharis applied to the skin is a rubefacient and vesicant, acting more slowly than mustard but much more severely. Internally it is also irritant, causing heat of stomach, gastralgia, nausea and vomiting, the circulation is stimulated, temperature elevated, urine becomes scanty and irritating, is voided with difficulty and pain, and often contains blood and albumin. Afterwards the pulse falls, temperature and arterial tension are lowered, and depression ensues. A toxic dose produces severe gastro-enteritis, abdominal tenderness, tenesmus, mucous or bloody stools, pain in the stomach and lungs, dysphagia, ptyalism, strangury, priapism, hematuria, swollen genitals, abortion, muscular tremor, convulsions, coma and insensibility. The post-mortem shows evidences of violent metritis, gastro-enteritis and general peritonitis. Cantharis is aphrodisiac by causing vascular turgescence of the genital apparatus, but only in doses which produce dangerous symptoms. It is abortive only in toxic doses. In small doses it is diuretic and emmenagogue.

Counter-irritation by rubefacients or blisters acts on disease probably through the nervous system. Its influence is explained by the theory that the peripheral extremities of the nerves supplying the skin of the part to which the agent is applied undergo some molecular change, which extends the nerve centre and is thence radiated to centrifugal or trophic nerves, ecting various changes in nutrition and secretion over the areas to which they are distributed. In addition to this method of action, neighboring parts are affected by direct extension of the inflammation produced, and distant parts are also affected by absorption through the vesicated surface of agents having special affinities for certain organs.

A blister acts primarily as a stimulant to the body generally as well as to the organs in its vicinity, but if permitted to remain long enough to produce a large bleb, the result is depression proportionate to the amount of serum abstracted, the serum of the bleb containing nearly as much albumin as the blood itself.

Antagonists and Antidotes.

There is no chemical antidote or physiological antagonist to Cantharis. Evacuation of the stomach, mucilaginous drinks freely, Opium for the gastro-enteritis, are the best measures in poisoning by this agent.

THERAPEUTICS.

As a counter-irritant and vesicant Cantharis is of great value in neuralgia if applied close to the emergence of the nerve from the spinal column, also in sciatica and neuritis, and in acute rheumatism around the affected joints. A blister at the nape of the neck controls many headaches, and one behind the ear will modify inflammatory affections of the eye. In pleuritic effusions a succession of small blisters (flying-blisters) will promote absorption of the pleural contents, and a blister applied to the peritoneum will often cure a rebellious gleet. Though valuable as a therapeutic measure in very many conditions, blistering is going out of fashion except in hospitals and among people who believe in heroic treatment. It is invaluable in subacute joint affections.

As an internal remedy Cantharis must be employed in very small doses (♏j–iij of the tincture) in order to be efficient. When so used it is an admirable agent in acute desquamative nephritis after the active inflammation and fever have subsided to reduce the albumin and blood in the urine. Drop-doses are particularly useful in irritable bladder with frequent desire to micturate, so often observed in women, also in the incontinence of the aged and of children; and in cystitis, gonorrhea and gleet. The same dose thrice daily will generally abate chordee. In spermatorrhea, prostatorrhea, scanty menstruation and menorrhagia in subjects of lax fibre and general want of tone it is often very serviceable. Cutaneous squamæ and vesiculæ are greatly improved by small doses frequently administered and gradually increased, and it is one of the best remedies for psoriasis. For alopecia areata it is of the utmost value as an external application, and the tincture, largely diluted, is an ingredient of all the hair renewers in common use. In pleurisy, after effusion has taken place, it will be found admirable in 1- to 2-drop doses every 2 or 3 hours, and in the after-prostration of diphtheria it proves a serviceable stimulant. One of the best applications to burns or scalds is a cloth dipped in a lotion of the tincture one part to thirty or forty of water. The same lotion is an efficient application to vesicular erysipelas and herpes zoster.

CAPSICUM, Cayenne Pepper, *African Pepper,*—is the fruit of *Capsicum fastigiatum,* a plant of the nat. ord. Solanaceæ, native in tropical Africa and America. It contains *Capsicin,* which is a thick, red liquid, and is the active principle,—also a volatile alkaloid having the odor of Coniïne. Dose of the powdered drug, gr. v–x.

Preparations.

Extractum Capsici Fluidum, *Fluid Extract of Capsicum,* alcoholic. Dose, ♏j–x.

Tinctura Capsici, *Tincture of Capsicum,*—5 per cent. strength. Dose, ♏v–xx.

Oleoresina Capsici, *Oleoresin of Capsicum,*—extracted by ether. Dose, ♏j–v.

Emplastrum Capsici, *Capsicum Plaster,*—prepared by spreading Resin Plaster on muslin and then applying a thin coating of Oleoresin of Capsicum, so that each square inch may contain about gr. j of the oleoresin. An excellent warming plaster.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Capsicum is irritant to the skin and mucous membranes. Externally used for sufficient length of time it will produce vesication, internally in quantity it will excite gastritis. In medicinal doses it increases the saliva, excites a sensation of warmth in the stomach, promotes appetite and digestion, and produces easier and more copious alvine evacuations. It stimulates the action of the heart, is diaphoretic and diuretic, also decidedly aphrodisiac. It is a general stimulant to the nervous system, but in repeated doses produces a slight narcotic effect upon the brain. On the vascular system it acts like ergot, powerfully constringing the vessels by influencing the unstriped muscular fibre in their walls, either directly or through the vaso-motor nerves.

Capsicum is an excellent stomachic tonic in atonic dyspepsia and in that of chronic alcoholism with tremor and insomnia. In acute dipsomania and delirium tremens large doses are efficient in producing sleep and promoting appetite. It is the best substitute for alcohol and opium in attempts to cure those habits. It is well used in intermittents, chiefly as an adjuvant to more active drugs,—in flatulent colic, especially when occurring in hysterical women and hypochondriacs,—also in low fevers and cholera as a stimulant. It gives good results in functional impotence, in spermatorrhea from loss of tone, in chronic parenchymatous nephritis to check the waste of albumin, and it is beneficial in chronic cystitis and in prostatorrhea. The tincture internally, and a plaster externally over the loins, are efficient in cases of renal congestion with habitual pain in ack and a trace of albumin in the urine. Locally the tincture diluted viij) or the powder with honey, forms an excellent gargle for relaxed throat and its accompanying cough, relaxed uvula, inflammatory sore throat, and the cynanche of scarlet fever, but they must be used with caution, as such applications are sometimes very irritating.

The Capsicum plaster is a mild counter-irritant, of great value in lumbago and other muscular rheumatisms as a palliative application.

CARBO, Carbon, C.—This element is widely distributed throughout all the kingdoms of nature. United with oxygen in the form of *Carbonic Acid Gas*, CO_2, it occurs in the air and in many mineral waters, while as carbonates, such as limestone, etc., it constitutes a large portion of the surface of the earth. [Compare the article entitled ACIDUM CARBONICUM, *ante*, page 91.] Another compound with oxygen, *Carbonic Oxide* or *Carbon Monoxide*, CO, is a highly poisonous gas, which is formed to a certain extent during the combustion of charcoal, but does not form salts. Two forms of Carbon are official, viz.:—

Carbo Animalis, *Animal Charcoal*,—prepared from bone, occurring in dull black fragments or powder, odorless and nearly tasteless, insoluble in water or alcohol.

Carbo Ligni, *Charcoal*,—prepared from soft wood, and very finely powdered; is black, shining, brittle, inodorous, tasteless and insoluble.

Preparations.

Carbo Animalis Purificatus, *Purified Animal Charcoal*,—the bone-phosphate and calcium carbonate being removed by digesting with Hydrochloric Acid and washing. Dose, gr. xx–ʒj.

Carbonei Disulphidum, *Carbon Disulphide*, CS_2,—is a clear, colorless, diffusive liquid, of strong, offensive odor, aromatic taste and neutral reaction; soluble in alcohol, ether, chloroform and oils, and in 535 of water; vaporizes at ordinary temperatures, and is highly inflammable. Dose, ♏ss–j.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Charcoal is an efficient deodorant and disinfectant, as it absorbs and condenses many gaseous bodies and vapors. It is evacuated unchanged by the bowel and exerts no specific action on the body.

Charcoal is used in pharmacy for decolorizing vegetable principles, removing alkaloids from infusions of plants, and making several preparations, as acidum sulphurosum, potassii iodidum, etc.

Externally, it makes an efficient disinfectant, absorbent and deodorant application to cancerous discharges, foul ulcers and gangrenous wounds. Having no odor it is not open to the charge of substitution of one smell for another. A small quantity added to water will keep it sweet for a long time. It is an excellent dentifrice if finely powdered.

Internally, it is used for the same purposes, namely, to absorb gases and offending products of indigestion. In flatulent dyspepsia, gastralgia, pyrosis, diarrhea, nausea of pregnancy, epidemic cholera, and constipation, it has warm advocates. When used internally for any time, an occasional purgative should be given to prevent its accumulation in the intestines. It has been proposed as an antidote for several alkaloidal poisons on theoretical grounds, but its efficacy in this respect is doubtful.

Carbon Disulphide is largely used in the arts, hence its effects are frequently observed. Persons exposed to its fumes are affected by headache, vertigo, over-excitement of the nervous system, emaciation, incoördination of movement, depression of all the special senses with impairment of sensation and motility and perhaps insanity. Inhaled directly, it excites violent coughing, and produces anesthesia characterized by great muscular rigidity. Being a powerful cardiac paralyzant, it is a dangerous anesthetic. In 3-drop doses it produces severe nausea and vomiting, with a sense of heat in the stomach and a weak and rapid action of the heart. It is a good solvent for Caoutchouc and many other substances.

Carbon Disulphide has such a horribly offensive odor that it will never be used for any purpose for which another agent can be found. It relieves the pain of gastric cancer, and in ½-drop doses will alleviate nausea and vomiting, also gastralgia. Locally it has been used as a counter-irritant and a local anesthetic, for deafness due to want of nervous energy, in facial neuralgia and various local pains.

CARDAMOMUM, Cardamom,—is the fruit of *Elettaria repens*, a plant of the nat. ord. Scitamineæ, cultivated in Malabar. It contains about 4½ per cent. of a *Volatile Oil*, $C_{10}H_{16}$, isomeric with Oil of Turpentine, the oil being the active principle; also a fixed oil, coloring matter, etc. It is an ingredient of Pulvis Aromaticus and of Extractum Aromaticum Fluidum (See under CINNAMOMUM), as well as of several compound preparations.

Tinctura Cardamomi, *Tincture of Cardamom*,—10 per cent. Dose, ʒj-ij.

Tinctura Cardamomi Composita, *Compound Tincture of Cardamom*,—has of Cardamom 20, Cinnamon 20, Caraway 10, Cochineal 5, Glycerin 50, Diluted Alcohol to 1000 parts. Dose, ʒj-ij.

Infusum Cardamomi, *Infusion of Cardamom* (Unofficial),—may be made in the strength of ʒij to the pint, and used in wineglassful doses.

Cardamom is aromatic, carminative and stomachic, and is used as an agreeable flavoring for bitter mixtures in dyspepsia and other gastric affections. It makes the best flavoring addition to saline solutions or mineral waters, and is particularly efficient to correct flatulence and griping when combined with purgatives.

CARDUUS (Unofficial),—the seeds of *Carduus marianus*, or St. Mary's thistle, an annual European plant of the nat. ord. Compositæ. A decoction (℥ij ad Oj) is the preparation usually employed. It is an old remedy revived as a hemostatic, and reported as being very efficient in hemoptysis, uterine hemorrhage, melena and amenorrhea connected with derangement of the portal circulation. It has proved curative in congestion of the liver and simple jaundice, and in Germany it has long been popularly deemed efficacious in gall stones and liver affections generally. Dose of the decoction, ʒj-℥ss, of a tincture, ♏x-xx.

Carduus Benedictus, the "blessed thistle," also called *Cnicus benedictus* and *Cen- benedicta*, is another plant of the same order, formerly held in high esteem as a ll." It contains *Cnicin*, an amorphous bitter principle, which has been used as an antiperiodic in doses of gr. v–x, but generally produces burning sensations and pharyngeal constriction, with nausea, vomiting, colic, and diarrhea. It acts chiefly as a bitter tonic, resembling Calumba and Taraxacum most closely.

CARUM, Caraway,—is the fruit of *Carum Carvi*, a European plant of the nat. ord. Umbelliferæ. Its odor and taste are aromatic and agreeable. The active principle is the *Volatile Oil*, which is also official. Caraway is an ingredient of Tinctura Cardamomi Composita.

Oleum Cari, *Oil of Caraway*,—is the volatile oil distilled from Caraway, and is resolvable into *Carvene*, $C_{10}H_{16}$, isomeric with Turpentine, and *Carvol*, $C_{10}H_{11}O$, isomeric with Thymol. It is an ingredient of Spiritus Juniperi Compositus. Dose, ♏j–v.

Infusum Cari, *Infusion of Caraway* (Unofficial),—ʒj–ij ad Oss. Dose, ℥ss–ij.

The Oil of Caraway is fatal to small animals, and in one case ʒj produced cerebral congestion, delirium and rigors in man. The chief use of Caraway is as a flavoring agent, but it is efficient in the flatulent colic of children, and to prevent griping from the use of purgatives.

CARYOPHYLLUS, Cloves,—are the unexpanded flowers of *Eugenia aromatica*, a handsome evergreen tree of the nat. ord. Myrtaceæ, cultivated in the East and West Indian Islands. They exude oil when scratched, have an aromatic odor and a pungent, spicy taste, and are contained in Tinctura Lavandulæ Composita, Tinctura Rhei Aromatica and Vinum Opii. They contain a heavy *Volatile Oil*, which is official; also *Eugenin*, $C_{10}H_{12}O_2$, a crystalline body; *Caryophyllin*, $C_{10}H_{16}O$, a camphor; *Caryophyllic Acid*, and tannin, gum, etc.

Preparations.

Oleum Caryophylli, *Oil of Cloves*,—a volatile oil distilled from cloves, soluble in alcohol, and of sp. gr. 1.060. It consists of a light and a heavy oil, the latter containing *Eugenol*, $C_{10}H_{12}O$, a phenol-like compound, and *Caryophyllin*, $C_{10}H_{16}O$, which yields as a product of its oxidation, *Caryophyllinic Acid*, $C_{20}H_{32}O_6$. Dose of the oil, ♏j–iv.

Infusum Caryophylli, *Infusion of Cloves* (Unofficial), may be made of strength 1 to 40, and used in doses of one to two fluid ounces.

Physiological Action and Therapeutics.

Cloves may be considered as a type of several agents yielding aromatic oils, which as a rule consist of terpenes with camphors, resins, fatty and other acids, etc., and are closely allied to phenol and benzoic acid, the balsams and gum-resins. Such are Orange, Lemon, Allspice, Cajuput, Caraway, Peppermint, etc. Their oils are antiseptic, locally anesthetic, stimulant and irritant, antispasmodic, stomachic and carminative. Internally they increase the circulation and temperature, promote digestion and nutrition (though in quantity they may cause inflammation), relieve pain and spasm, and are excreted by the kidneys, skin, liver and the bronchial mucous membrane, stimulating and disinfecting their routes throughout the organism.

These agents are used to flavor pharmaceutical preparations, to correct the griping tendency of many purgatives, to correct flatulence, to relieve pain in the stomach and bowels, and to promote the flow of saliva and gastric juice. As external applications they are efficiently employed for anesthetic and counter-irritant purposes, to relieve pain in chronic rheumatism, myalgia, lumbago, superficial neuralgia, toothache, etc. The Oil of Cloves is an effective deodorizer for sponge-tents, a good application to a painful tooth, and is occasionally applied over the course of an aching nerve with relief to the pain.

CASCA BARK, Sassy Bark, Ordeal Bark (Unofficial),—is the bark of *Erythrophlœum Guinense*, an African tree, used by the negroes as an ordeal in trials for witchcraft. It contains a poisonous glucoside, *Erythrophlein*, and when used in quantity produces nausea and vomiting, stricture across the brow, severe cephalalgia, narcosis and death. It is used as a remedy for intermittent fever, dysentery, diarrhea and colic, and is considered to resemble Digitalis in action and uses. A tincture is made (℥ij ad Oj) of which the dose is ♏x; or a watery extract may be used in doses of gr. j.

Erythrophlœin, the active principle, is a glucoside, and is said to be a local anesthetic of extraordinary power, even surpassing Cocaine. It is found in Africa in a red mass, called "Hayah," which is proven to be identical with an extract of the original plant described by Oertel early in the last century, and deposited by him in the Berlin Museum. It closely resembles Digitalis in action, being a cardiac tonic and a hydragogue diuretic.

CASCARA AMARGA, Honduras Bark (Unofficial),—is the bark of a Mexican tree of the nat. ord. Simarubaceæ, which has been used with apparent success as an alterative tonic and diuretic in syphilis and various chronic skin affections. The use of tobacco and alcohol seems to counteract its usefulness. It is certainly a very powerful tonic and has been employed by competent observers with uniformly good results in syphilis and syphilodermata, chronic liver complaints, chronic eczema, chronic nasal catarrh and psoriasis. A Fluid Extract is on the market, of which the dose is ʒss–j thrice daily.

CASCARILLA,—is the bark of *Croton Eluteria*, a shrub or small tree of the nat. ord. Euphorbiaceæ, growing in the Bahamas. It contains *Cascarillin*, a crystalline principle, two resinoid extracts, aromatic volatile oils, with tannic acid, etc. There are no official preparations, but an Infusion (1 to 10) or a Tincture (1 to 10) may be prepared and given in doses of ʒj–℥j.

Cascarilla is an aromatic bitter. It increases appetite and digestion, the mucous secretion, the flow of saliva and gastric juice, stimulates the intestinal secretions, and acts as a mild astringent by the influence of its tannin. Large doses produce nausea, vomiting and diarrhea, and in medicinal doses continued it will set up gastric catarrh and consequently indigestion. It has slight antiperiodic power.

It has been used with success in epidemic dysentery, flatulent dyspepsia, debility, chronic bronchitis, intermittents, and low nervous fevers. It is difficult to dispense, as the infusion decomposes quickly, and acids precipitate the resin from the tincture.

CASSIA FISTULA, Purging Cassia,—is the fruit of *Cassia Fistula*, a tree of the nat. ord. Leguminosæ, growing in tropical regions of Asia, Africa and America. No active principle has been isolated as yet. The pulp is the only valuable part of the drug. There are no official preparations, but it is one of the ingredients of Confectio Sennæ.

Cassia-pulp is laxative in doses of ʒj–ij, and purgative in large quantities, producing nausea, flatulence and griping. It is rarely prescribed alone, owing to its tendency to cause colic and flatulence.

CASTANEA, Chestnut,—the leaves of *Castanea dentata*, a stately tree of the nat. ord. Cupuliferæ, which should be collected while green. They contain tannic and gallic acids, salts, gum, etc.

Extractum Castanea Fluidum, *Fluid Extract of Castanea.*—Dose, ʒss–ʒij.

This drug has not been studied as to its physiological action, if it has any. It is classed among the vegetable astringents by reason of its containing tannin. Its only reputation therapeutically is as a remedy for whooping-cough, in which it is said to be very efficacious. An infusion or a decoction of the leaves has been used, in indefinite doses.

CATECHU,—is an extract prepared from the wood of *Acacia Catechu*, a tree of the nat. ord. Leguminosæ, native of the East Indies. It occurs in irregular masses, bark brown and brittle, nearly inodorous, but of astringent and sweetish taste, soluble in alcohol, and partly so in water. It contains *Catechutannic Acid* 50 per cent.; also *Catechuic Acid*, which is converted into the former by heat. Dose, gr. j–ʒss.

Preparations.

Tinctura Catechu Composita, *Compound Tincture of Catechu*,—contains Catechu 10, Cinnamon 5, Diluted Alcohol q. s. ad 100 parts. Dose, ♏x–ʒj.

Trochisci Catechu, *Troches of Catechu*,—each troche contains of Catechu nearly 1 grain, mixed with Sugar, Tragacanth and Orange-flower Water.

Catechu is a powerful astringent, acting by virtue of its tannic acid. (See *ante*, page 96, for action and incompatibles.) Its uses depend entirely on its astringency. In the diarrhea of children the Tincture with Chalk-mixture is very serviceable, and with Opium it is efficient in dysentery. It is also used as a gargle and mouth-wash in relaxed conditions of the pharyngeal mucous membrane, as an injection in leucorrhea, and to control passive hemorrhages, to harden spongy gums, etc.

CAULOPHYLLUM, Blue Cohosh,—is the rhizome and rootlets of *Caulophyllum thalictroides*, a plant of the nat. ord. Berberidaceæ, growing in Canada and the northern United States, and contains *Saponin*, a glucoside and two resins. Dose, gr. v–xx. There are no official preparations. The eclectic preparation *Caulophyllin* is a resinous precipitate obtained by pouring an alcoholic extract into water.

Caulophyllum is a new addition to the pharmacopœia, and has not yet been made the subject of experimental work by reliable observers. It was much used by the aborigines of this country in all affections to which their women were peculiarly subject, and was known among them by the name "squaw-root." It is said to produce intermittent contractions of the gravid uterus, to have diuretic, emmenagogue, and antispasmodic powers; and is used as a remedy for deficient labor-pains, spasmodic after-pains, spasmodic pains in the uterus at any time, spasmodic dysmenorrhea, and pains in other organs seemingly in sympathy with uterine affections. It has somewhat of a reputation in acute rheumatism of the hands and fingers, and as a preparative medicine for labor.

CERA, Wax,—a mixture of *Myricin, Cerotic Acid* and *Cerolein*, is formed by the honey-bee, and exists in the pollen and leaves of many plants, particularly in *Myrica cerifera*, the wax myrtle. That produced by the bee is alone official.

Cera Alba, *White Wax*,—is yellow wax bleached.

Cera Flava, *Yellow Wax*,—is a concrete substance prepared by *Apis mellifica*, the honey-bee. It is a yellowish solid, of agreeable odor and faint, balsamic taste, insoluble in water or in cold alcohol, but soluble in 35 of ether, 11 of chloroform, in boiling alcohol, fixed and volatile oils.

Ceratum, *Cerate*,—consists of White Wax 30, Lard 70.

Unguentum, *Ointment*,—consists of Yellow Wax 20, Lard 80.

Wax is also a constituent of the 5 compound Cerates, 2 of the 22 compound Ointments, and 2 of the 13 Plasters.

Wax owes its value to its power of resisting decomposition and many chemical agents. Its fusibility at a moderate degree of heat, and its solidity at the temperature of the body, together with its unirritating quality, make it a valuable ingredient of the cerates and ointments to give them consistence. Ceratum and Unguentum may be used as simple protective applications. They form the bases of almost all the compound preparations so named.

CERII OXALAS, **Cerium Oxalate**, $Ce_2(C_2O_4)_3 + 9H_2O$,—is a white, slightly granular powder, odorless and tasteless, insoluble in water or alcohol, but soluble in diluted sulphuric or hydrochloric acid. Dose, gr. j–x, in pill or powder.

Cerium Oxalate is a gastric sedative, and is thought to possess selective action as such on the motor distribution of the pneumogastric nerve. It is considered to be particularly useful in vomiting of reflex origin, especially in the vomiting of pregnancy, but it often fails, probably because not given in sufficient doses. To be effective, at least 4 or 5 grains should be given 3 times a day to adults, and no results promised until after it has been used several days. It is also recommended in the vomiting of phthisis and bronchitis, cough with vomiting, chorea, and diarrhea.

CHAULMOOGRA OIL (Unofficial),—is a fixed oil expressed from the seeds of *Gynocardia odorata*, an East Indian tree of the nat. ord. Bixaceæ. It is nauseous and bulky, and soluble in alcohol, ether, chloroform, etc. Its active principle, *Gynocardic Acid*, is the best preparation for use, and may be given internally in doses of gr. ss–iij, or applied as an ointment, gr. xx ad ℥j of Petrolatum. Dose of the oil, gtt. v–x, in capsules.

Chaulmoogra Oil is credited with a few cures of leprosy, and several cases improved by its use both internally and externally. It is recommended as an external application in scaly eczema, psoriasis, syphilitic skin-diseases, chronic rheumatism, rheumatic arthritis and tabes mesenterica.

CHELIDONIUM, **Celandine**,—is the plant *Chelidonium majus*, nat. ord. Papaveraceæ, which grows in Europe and N. America, about rocky places. It contains 2 alkaloids, *Chelidonine*, $C_{19}O_{17}N_3O_3$, and *Chelerythrine*, the latter being identical with Sanguinarine: also *Chelidoxanthin*, a yellow, crystalline substance, and *Chelidonic Acid*, supposed to be identical with Succinic Acid. Dose of the plant, gr. v–xxx,—of the fresh juice ♏ v–xx. There are no official preparations.

Chelidonium used externally is irritant, internally it is a drastic purgative but an unreliable one. It is also perhaps diuretic, diaphoretic and expectorant. In overdoses it is considered poisonous. It is an old remedy for jaundice and liver affections, but has been obsolete for some time. The fresh juice is a popular application for warts and corns, and a tincture in whiskey is used in Indiana as a remedy for phthisis, the menstruum being probably the most useful agent. It seems to be of real service in simple jaundice, whooping-cough, right-sided pneumonia with hepatic involvement, and the catarrhal pneumonia of children.

CHENOPODIUM, American Wormseed,—is the fruit of *Chenopodium ambrosioides*, var. *anthelminticum*, a plant of the nat. ord. Chenopodiaceæ, indigenous to the United States. Its active principle is a *Volatile Oil* which is official.

Oleum Chenopodii, *Oil of Chenopodium*,—a thin, colorless or yellowish liquid, of aromatic odor and pungent, bitter taste. Dose, ♏v–xv.

The Oil is the only preparation used and that rarely, its odor and taste being very disagreeable. It increases the cardiac rate, and promotes the secretions of the skin, bronchi and kidneys. It is an efficient anthelmintic against the round worm in doses of gtt. x three times a day for two days, followed by a cathartic. It seems to possess some tonic properties, and certainly is a diffusible stimulant. As such it has been used with benefit in chorea, hysteria, flatulent dyspepsia, and chronic malaria.

CHIMAPHILA, Pipsissewa,—the leaves of *Chimaphila umbellata*, or Prince's Pine, an evergreen plant of the nat. ord. Ericaceæ, indigenous to all parts of the United States. It contains *Chimaphilin*, a yellowish crystalline principle, *Arbutin*, also crystalline but colorless, with tannic acid, etc.

Extractum Chimaphilæ Fluidum, *Fluid Extract of Chimaphila*,—Dose, ʒ ss–ij.

Decoctum Chimaphilæ, *Decoction of Chimaphila* (Unofficial),—1 to 17. Dose, ℥ j–iij.

Chimaphila is a tonic, astringent diuretic, belonging to the same class as Buchu, Uva Ursi, Pareira and Scoparius. It is probably the most active diuretic among this group, stimulating all the excretory organs but especially the kidneys. It is an agreeable tonic, excites the appetite and promotes digestion. The fresh leaves, bruised and applied to the skin, are rubefacient and vesicant, showing the presence of some irritant principle.

Chimaphila is a good diuretic in dropsy, and is efficient in several forms of chronic kidney disease with albuminuria, and in chronic catarrhal affections of the urinary passages, as hematuria, ischuria, dysuria and gonorrhea. It is believed to check the secretion of uric acid, and should prove useful in gout and rheumatism. Externally, it has been applied to ulcers and tumors with benefit.

CHINOLINUM, Chinolin, *Leucolin, Quinolin*, C_9H_7N (Unofficial),—is a constituent of coal-tar oil, but may be obtained from quinine or cinchonine by their destructive distillation with potassium hydrate, and is artificially prepared by heating anilin or nitro-benzol with glycerin in the presence of a dehydrating agent. Chemically, it is considered to be formed by a union of benzene and pyridine atoms. (Compare the article CINCHONA.) It is a colorless, oily liquid, strongly refractive, turning dark on exposure to the air; soluble in alcohol, ether and carbon disulphide, sparingly soluble in water. It combines, like an alkaloid, with acids to form crystalline salts; all of which, except the tartrate, are very deliquescent.

Chinolini Tartras, *Chinolin Tartrate* (Unofficial),—a white crystalline powder, of pungent odor, sharp taste, stable in the air and soluble in water. Dose, gr. v–xx.

Chinolin is a valuable antiseptic and antipyretic, being nearly as effective in this respect as quinine, which it closely resembles in chemical characteristics and physiological action. It is one of the most powerful antipyretics of the substances which have been discovered in the search for an artificial quinine (hydroquinone, antipyrin, pyrocatechin, resorcin, thallin, kairin, etc.). Chinolin itself has a very disagreeable taste and smell, and is irritant in action, hence the tartrate is preferred for medicinal use. It has been extensively used as an antipyretic in pneumonia, typhus, diphtheria, typhoid and other fevers, with varying success. In diphtheria, a 5 per cent. solution in weak alcohol is painted on the affected surface with great benefit. The tartrate has been used beneficially in neuralgia and whooping-cough, and as an antiperiodic in intermittents.

Quinalgen, *Ortho-æthoxy-ana-mono-benzoyl-amido-quinolin* (Unofficial),—is a derivative of Chinolin, and is a reformed and renamed *Analgen* (see *ante*, page 78), differing therefrom by having the benzoyl instead of the acetyl radicle. Its action is similar to that of Antipyrin, except that it is claimed for this substance that no unpleasant effect or after-effects are noticed after taking it. It has been used in gout, influenza, migraine, sciatica, neuralgia, hay fever and rheumatic pains, with asserted benefit. Dose, gr. viij–xv, not to exceed gr. xlv daily.

Chinosol, *Quinosol, Potassium Oxy-chinolin-sulphonate* (Unofficial),—is a lemon-yellow powder, soluble in water, and said to be powerfully antiseptic, disinfectant and deodorant, even in weak solutions. The powder is irritant to wounds when applied dry, but not when in solution. Its advocates claim for it greater antiseptic efficacy than possessed by mercuric chloride, also that it is non-toxic and does not coagulate albumin. On the other hand Ahlfeld and Vahle state that its germicidal power is feeble and that it disturbs the functional activity of the kidneys. It is much used as an antiseptic in gynecological and obstetrical practice, generally in aqueous solution of 1 in 1000.

CHIRATA, Chirata, *Chiretta*,—is the Indian plant *Swertia Chirata*, nat. order Gentianaceæ, occurring in bundles, composed of all but the coarser woody stems. It is inodorous, but intensely bitter, and contains two amorphous bitter principles, named *Chiratin* and *Ophelic Acid*, but no tannin. Dose of the powdered plant, gr. xv–xxx.

Extractum Chiratæ Fluidum, *Fluid Extract of Chirata*,—made with glycerin and diluted alcohol. Dose, ♏xv–xxx.

Tinctura Chiratæ, *Tincture of Chirata*,—10 per cent. Dose, ʒss–ij.

The action of this plant is that of a simple bitter, like its congener Gentian. It is an excellent tonic, in this respect rivalling Cinchona, and is used in India as a substitute for the latter. It is laxative and stomachic, diminishes flatulency and acidity, and is particularly serviceable in the dyspepsia of gouty subjects. As it contains no tannin, it may be administered with preparations of Iron.

CHLORAL, Chloral, *Chloral Hydrate*, $C_2HCl_3O + H_2O$,—is a crystalline solid, composed of Trichloraldehyde (Chloral) with one molecule of water. It occurs in colorless, transparent, rhomboidal crystals, slowly volatilizing when exposed to the air; of aromatic, penetrating and slightly acrid odor, bitterish, caustic taste, and neutral reaction. It is freely soluble in water, alcohol, ether, chloroform, oils, etc.; liquefies when triturated with about an equal quantity of camphor, menthol, thymol or carbolic acid; melts at 136° F. and is decomposed by alkalies into chloroform and a formiate of the alkaline base. Its aqueous solution becomes acid, but the alcoholic solution remains neutral.

Chloral itself, (Trichloraldehyde, C_2HCl_3O), is an unstable, oily, color- s fluid, formed by the action of chlorine upon alcohol, whence its ne, Chlor-al. The Hydrate is the only official preparation.

The Dose varies much with individual susceptibility and with the presence or absence of cardiac and pulmonary disease. Death has been caused in several instances by gr. xxx, in one case by gr. x, and in another gr. vijss produced alarming symptoms, all being in adults. On the other hand, recovery has occurred after the ingestion of an ounce, several hundred grains having been taken at a time in more than one instance without fatal results, and where tolerance has been established by habitual use ʒ ij–ʒ iij are frequently taken without poisonous symptoms. An average dose for a healthy adult is gr. xx, for a child gr. j for each year of age up to gr. vj. It is best given in Syrup of Tolu, or in Peppermint water.

Caution is necessary when prescribing this drug in combination with alcoholic preparations, as the Chloral is then very apt to separate as an alcoholate, especially if the Bromides of Potassium or Sodium are used in the same mixture and if the solutions are at all concentrated. In this way great danger is incurred of giving a heavy overdose, as the alcoholate floats on the surface of the mixture, and the entire amount of Chloral contained therein may be taken at a single dose.

Unofficial Preparations.

Chloralamid,—is described under its own title.

Hypnal is a combination of Chloral and Antipyrin, occurring as tasteless and odorless rhombic crystals, soluble in 6 of water, and credited with simultaneous action as a hypnotic and an analgesic. Dose, gr. xv–xxx in aqueous mixture with some alcohol, flavored with syrup of orange. It is said to cause no gastric disturbance. Although Chloral and Antipyrin are incompatible with each other, they form, when heated together, the above described compound, which resembles both and yet differs from each. Its chemical appellation is *Tri-chloraldehyd-phenyl-dimethyl-pyrazolon.*

Somnal,—is the suggestive name given to a liquid preparation formed by the union of Chloral, Alcohol and Urethan, described as *Ethylirtes Chloral-urethan*, represented by the formula $C_7H_{12}Cl_3O_3N$, and claimed to be a complex body, not a simple mixture of its constituents. It occurs as a colorless liquid, resembling chloroform in its behavior with cold water, with which it forms globules and refuses to mix or dissolve. It is soluble in hot water, in alcoholic solutions, and in alcohol, 3 parts in 1. The advantage claimed for Somnal is that when administered in 20-grain doses it induces within half an hour a quiet sleep lasting from six to eight hours without any inconvenient results. Doses of 45 and even 60 minims produced no depression of the circulation or respiration. In doses of ʒ ss its action is usually very prompt, the dose is well borne, easily taken (in a little syrup of tolu or whiskey), and entirely without deleterious results. The effects are much more striking and certain than those of Urethan, and far less depressing than those of Chloral; and there is no vertigo or depression, as may follow the use of Sulphonal. In drachm-doses, this drug is not powerful enough to decidedly control delirium tremens, maniacal delirium or severe pain. (Dr. Gilman Thompson.)

Somnal manifests its hypnotic and sedative action to best advantage in the insomnia of convalescence from acute disease, but where an adynamic condition exists it must be used with caution. In whooping-cough, spasmodic laryngitis, asthma, the so-called "nervous cough" and in chorea, it shows decided sedative properties. A great element of safety in its use is that its action is never out of proportion to the quantity ingested, nor does it act in a cumulative or other unexpected manner. It seems to have little or no influence over insomnia due to acute inflammation. (Myers.) It is injurious in acute mania and general paralysis, but is of great value in cases of melancholia, in which it promotes sleep and produces a soothing effect on the mental condition by removing depression and gloomy forebodings. It is contra-indicated when the digestion is out of order. (De Montyel.)

Official Analogue of Chloral.

Paraldehydum, *Paraldehyde,*—is described under its own title.

Unofficial Analogues of Chloral.

Amylene Hydrate, $C_5H_{12}O$, *Di-methyl-ethyl-carbinol,*—is a tertiary alcohol, occurring as a clear, colorless fluid, of peculiar odor, soluble in 8 of water and readily miscible with alcohol. It is one of the most valuable hypnotics, in power standing between chloral and paraldehyde, but being much more agreeable to the taste and safer than either of those agents. Its action is exerted chiefly on the cerebrum in doses sufficient to produce profound narcosis; while in medicinal doses it leaves behind no unpleasant effects and has no perceptible influence on the heart or respiration, these being paralyzed, however, by very large doses. Dose, ʒj–jss.

Dormiol, *Amylene-chloral*,—is a mixture of one molecule each of chloral and amylene hydrate, forming a colorless, oily fluid. It is a prompt, reliable and safe hypnotic, in doses of ℥ss–j of the 10 per cent. aqueous solution, in which it is marketed.

Chloral Butylicum, *Croton-Chloral*,—is described under its own title.

Hypnone, $C_6H_5(CO)(CH_3)$, *Phenyl-methyl-acetone*,—is a member of the Ketones, occurring above 70° F. as a colorless, mobile liquid, insoluble in water or glycerin, and best given in capsules. It is a hypnotic of only moderate intensity, but said to be especially useful in the insomnia of alcoholism. Its use is devoid of danger, and leaves behind no unpleasant effects, except a disagreeable odor of the breath. In very large doses it has induced coma, followed by paralysis of the heart and respiration. Dose, ♏v–x, in capsule, ♏vij or ♏viij being usually required.

Methylal, $CH_2(OCH_3)_2$, *Methylene-di-methyl Ether*,—is one of the products of the oxidation of Methylic Alcohol, occurring as a volatile, mobile liquid of pleasant, aromatic odor and taste, readily soluble in water, alcohol, etc. It is a local anesthetic, and an efficient hypnotic, producing a deep sleep of short duration, with more or less general anesthesia and lowered reflex excitability. It is depressant to the heart, respiration and body-temperature, but in medicinal doses does not cause any bad after-effects. Dose, ♏iv–v, repeated thrice at short intervals.

Urethan, *Ethyl Carbamate*, $NH_2CO_2C_2H_5$,—occurs in crystals which are readily soluble in water, with scarcely any taste or odor. It is a pure hypnotic, but a mild one at best, and not so reliable as paraldehyde or chloral. It does not affect the circulation, nor does it depress (but rather stimulates) the respiration. It acts directly on the cerebrum, causing a sleep which closely resembles the normal, and has no unpleasant after-effects. In very large doses it slows the heart, lowers the temperature, and induces muscular resolution and general anesthesia. In small animals it effectually antagonizes the action of Strychnine. Dose, gr. xv–ʒj, an average hypnotic dose being gr. xxx; but it is best given in 5 grain doses repeated frequently, as a large dose may cause vomiting. It is a safe and efficient hypnotic for children. (Squibb.)

PHYSIOLOGICAL ACTION.

Chloral is a powerful hypnotic, also an antispasmodic, an antiseptic, a preventive of the coagulation of fibrin, indirectly an anesthetic, and especially a depressant of the cerebral, medullary and spinal centres and of the cardiac muscle. It is more hypnotic than chloroform but less anesthetic. Applied to the skin or mucous membranes a 1 per cent. solution (gr. v ad ℥j) is antiseptic, but strong solutions are irritant and vesicant, may produce sloughing ulcers, and if taken internally may excite gastritis with nausea and vomiting.

After a brief period of stimulation a medicinal dose depresses the heart, dilates the peripheral vessels and lowers arterial tension, diminishes oxidation and decreases the body-temperature. On the brain cells it has a selective action, producing a deep sopor very like normal sleep, from which the patient may be awakened, but immediately falls asleep again, and which is not followed by headache or depression. This effect is considered by some authorities to be the result of cerebral anemia produced by the drug. In some persons, instead of sleep it causes headache, insomnia and delirious excitement. It is not an anodyne, as it does not affect the conductivity of the sensory nerves, and does not interrupt the transmission of pain; but by overwhelming the centres it drowns the *consciousness* of pain, and is therefore indirectly anesthetic. A toxic dose produces profound narcotism, abolishment of reflexes and sensibility, complete muscular relaxation, and a great fall of body-temperature. Death may result in the chloral sleep from paralysis of the respiratory centre or the cardiac motor ganglia, or by sudden failure of the heart-muscle in cases of fatty degeneration or in old drunkards.

On the blood its action is to increase the fluidity, to crenate the red corpuscles, and to destroy the leucocytes if used in large quantity. It is rapidly diffused and is excreted by the kidneys partly unchanged, but chiefly as urochloralic acid, producing some diuresis,—also by the skin, causing various eruptions if used for any lengthened period. It has been held that the blood, being an alkaline fluid, decomposes it, setting free chloroform, but there are many facts against this theory.

The Chloral habit produces a state of marked anemia and muscular weakness, especially of the legs; its subject presenting a weak, irritable, often irregular heart, deranged hepatic functions, jaundice, bileless stools, perhaps purpura and sloughing of a finger from decreased blood-supply. Its votaries are on the border of insanity, excitable, uncontrollable in speech and action, talking in a silly manner and very volubly, and showing a marked loss of power of the limbs, so much so as to simulate paralysis thereof. Many cases of insanity have their origin in chloralism.

Chloral and Atropine, though antagonistic in their action on the spinal cord, both produce motor paralysis, the former by paralyzing the cord, the latter by direct paralysis of the motor nerves.

Antagonists and Incompatibles.

Atropine antagonizes its cardiac, respiratory and spinal depression, and should be injected in small doses frequently repeated, until its effects are apparent. *Morphine* administered with Chloral antagonizes the tendency to cardiac failure, while synergistic to the hypnotism. While Chloral is the antagonist to *Strychnine*, opposing the spinal action of that drug, the reverse is true only to a very limited extent; yet in a case described by Dr. Colenso in the *British Medical Journal*, Nov. 3, 1894, in which recovery occurred after the ingestion of an ounce of Chloral, nine-tenths of a grain of Strychnine was employed by hypodermic injection in broken doses. *Heat* is a necessary application, to maintain the body-temperature. *Artificial Respiration* should be employed if required. All *Alkalies* are incompatible with preparations containing Chloral.

THERAPEUTICS.

Chloral Hydrate is of great value as a hypnotic and antispasmodic, but must be cautiously used if at all in persons with weak or fatty heart, atheromatous vessels or advanced pulmonary disease. In combination with Potassium Bromide it is much used in asylum and general practice, and equally abused, both drugs being active cardiac poisons. It is by far the best hypnotic in acute mania and in delirium tremens, but has been too incautiously employed therein. The condition of acute alcoholic intoxication seems, however, to antagonize its depressant action on the heart to a great extent, even in old topers, for 30-grain doses, repeated twice within 7 or 8 hours, are commonly used in inebriate asylums and by police surgeons, for the purpose of straightening up a case of acute alcoholism, with no fatal effects resulting from its direct action. Chloral possesses marked power to relax spasmodically contracted unstriated muscle and to dilate the peripheral vessels, properties which govern its employment in many morbid conditions. Associated with Potassium Iodide it is of service in bronchial asthma, and has been used in the form of an enema for checking hemoptysis by the revulsion which it produces in dilating the cutaneous vessels. Chloral is exceedingly efficient as a gastric antiseptic and sedative in the so-called nervous dyspepsia of neurotic persons, characterized by severe pain in the cardiac region of the stomach. It is very serviceable in fevers, when high temperature exists with excitement, restlessness and a sthenic condition, as it lowers temperature and prevents the coagulation of fibrin. In the algid stage of cholera and in violent cases of cholera morbus it has been injected hypodermically in 15-grain doses with extraordinary efficacy. In sea-sickness, small doses (gr. v) two or three times a day are generally very efficient. In obstetrics it is used to relieve suffering, relax the os uteri, palliate convulsions and relieve afterpains. For nocturnal epilepsy a full dose at bedtime is a useful palliative. In neuralgia it may be triturated with Camphor and applied over the course of the affected nerve, and the same mixture is efficiently employed as a local application for toothache and earache.

Chloral is well borne by children, and is an excellent remedy for infantile convulsions and colic, chorea, whooping-cough, laryngismus stridulus and the first stage of diphtheria, but it should not be used when the first sound of the heart becomes dull and weak. It is highly efficient for the purpose of calming children in scarlet fever. In these affections it may be given with paregoric, as its combination with Opium enhances its value and guards the patient against its dangers. Its hypnotic power in adults is much increased by the conjoint administration of laudanum or morphine, and this combination is an excellent remedy in colic, cholera and cholera morbus. Tetanus is well treated by Chloral and Potassium Bromide given together in full doses. In Strychnine poisoning Chloral is the antagonist. It is generally given by the mouth in very dilute solution with some simple elixir, syrup of tolu, or cinnamon-water, but is well absorbed by the rectum. Its hypodermic administration is liable to result in great local irritation and even sloughing ulcers.

Chloral may be applied to the skin as an antipruritic in the eruptive diseases, for which purpose it is well combined with Carbolic Acid, ten
s of each to an ounce or two of water or oil. It is said to be the
all local applications for boils, ʒjss in ℥iv each of glycerin and
stantly applied to the boil by a tampon of cotton. For ulcers

and cancers a 25 per cent. solution is a good antiseptic and anodyne application.

The chief contra-indication to the use of Chloral is the presence of a cardiac affection, although it may be prescribed with much benefit in neurotic palpitation of the heart and in pseudo angina pectoris. Other contra-indications are rosacea, or a tendency to it, and hysteria of grave character. It readily produces congestion of the face, and in hysterical subjects it may excite paroxysms of delirium and hallucinations.

CHLORAL BUTYLICUM, Butyl-chloral Hydrate, *Croton-chloral,* $C_4H_5Cl_3O,H_2O$ (Unofficial),—is formed by the action of Chlorine upon Aldehyde, adding to the Butyl-chloral thus produced the necessary water. It occurs in crystalline scales, insoluble in chloroform, sparingly soluble in water, (1 in 100), but freely soluble in alcohol, in hot water and in glycerin, (1 in 4). Dose, gr. v–xx, in syrup or pill;—but the best method is to give 5 grains every half-hour until 20 grains have been taken or until relief is afforded.

The action of Croton-chloral closely resembles that of chloral, but it is feebler as a hypnotic, less depressant to the heart, and generally less poisonous, but more disagreeable to the taste. It has a specific paralyzant power over the fifth nerve, and over its distribution causes an anesthetic condition long before it produces general anesthesia (Liebreich). It has been used with benefit in various neuralgiæ, especially tic-douloureux, also in sciatica and dysmenorrhea. All statements concerning the action and therapeutics of this drug are to be received with hesitation, as wide differences therein are reported by the best authorities.

CHLORALAMIDUM, Chloralamid, *Chloral Formidate,* (Unofficial), is chemically a union of Chloral Anhydride (C_2HCl_3O) with Formamide ($CHO.NH_2$). It is a proprietary drug, having been both patented and trade-marked, wherever possible, by its proprietor and exclusive manufacturer, Schering, of Berlin. It occurs as colorless, faintly bitter, odorless crystals, which are decomposed in hot water or warm solutions, and are soluble in 20 parts of cold water, or in 1½ of alcohol; rapidly decomposed by caustic alkalies and slowly by alkaline carbonates.

The Dose is put at from 10 to 60 grains. The average adult hypnotic quantity is about 30 grains, given in a teaspoonful of whiskey or brandy, or in any alcoholic compound; for example, 30 grains in 2 drachms each of Tinct. Cardamom. Co. and Elixir Simplex, at one dose. By some observers 45 grains are considered the limit of safe dosage and equal to 30 grains of Chloral Hydrate; by others this amount is considered necessary for its certain hypnotic action. Sixty grains have frequently been administered, and in one case 140 grains were taken at one dose, without producing unpleasant symptoms;—but, as Dr. Steele has pointed out, the slow solubility of the drug in the watery contents of the stomach must be taken into account, and when considering its effect, the action of the menstruum and the condition of the gastric mucous membrane should be known.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

The action of Chloralamid is essentially hypnotic; it has been extensively advertised as the least depressant and most efficient sleep-producer at our command, without unpleasant after-effects from ordinary doses, except in 2 per cent. of the cases in which used, 1 per cent. having gastric and the other 1 per cent. having cerebral symptoms; while these were always slight unless the dose of 30 grains had been exceeded. The more severe and unusual effects (from doses above 30 grains) are vertigo, thirst, nausea, dry mouth, vomiting, anorexia, slight delirium, cardiac weakness, rapid and feeble pulse, and restlessness. The drug does not seem to have any cumulative action, or any tendency to provoke a habit of using it. It is also credited with considerable analgesic power in certain conditions (see below), as well as with anti-dyspneic and anti-hydrotic action.

The main field for the use of Chloralamid is found in the treatment of insomnia, particularly the simple or idiopathic form, and when not due to excitement or severe pain, but from nervousness, hysteria, chronic alcoholism, and similar states; also in that accompanying typhoid fever, asthma (both cardiac and bronchial), organic heart disease, the opium habit, and diabetes mellitus (Steele). It is less effective in organic nervous affections and mental disorders, and is useless in these conditions when the insomnia is due to excitement, hallucinations, or severe pains. As an analgesic, it has lessened and checked the pains of aneurism, carcinoma of the stomach and liver, sarcoma of a rib, erysipelas, rheumatic fever, gall-stone, etc.; and in dysmenorrhea it has given entire relief, used just as the painful period approached, in a single dose of 30 grains. It has been reported curative of chorea, in doses of 15 grains thrice daily for five days, in a boy of eleven years; and in a girl who had resisted all other treatment for the same affection, it was successful in 8 days.

Compared with Sulphonal, Chloralamid is preferred for all cases in which collapse is feared, by reason of its apparent freedom from depressant action on the cardiac centres or the respiratory mechanism. In phthisis it has proven efficient against the most obstinate night-sweats, while at the same time securing rest in cases in which the cough was not very violent. To secure its best hypnotic results, the drug should be given about an hour and a half before sleeping-time, in a dilute alcoholic menstruum, and on a stomach containing little or no watery fluids to interfere with its solution and absorption.

CHLOROFORMUM, Chloroform, $CHCl_3$ (or $CHCl_2Cl$), Absolute Chloroform, the *Terchloride of Methyl*, or the *Chloride of Bichlorinated Methyl* (Di-chlor-methyl Chloride),—is formed by the substitution of 3 atoms of Chlorine for 3 of Hydrogen in Methyl Hydride (marsh-gas, CH_4). In practice it is obtained from Ethylic Alcohol or Methylated Spirit by the action of Chlorinated Lime, or from Chloral by an alkaline hydrate, and is known chemically as *Normal Chloroform*. If prepared from Methylic Alcohol (wood-spirit) it is called *Methylic Chloroform*, and is purified with great difficulty. The object of purification is to remove the chlorinated pyrogenous oil. Absolute Chloroform has a sp. gr. of 1.500, and decomposes easily in sunlight or diffused daylight, but when reduced to a sp. gr. of 1.485 to 1.490 by alcohol it will keep well. The official form is—

Chloroformum, *Chloroform*, $CHCl_3$,—a liquid consisting of 99 to

99.4 per cent. by weight, of absolute Chloroform, and 0.6 to 1 per cent. of Alcohol. A heavy, clear, colorless, mobile and diffusible liquid, of characteristic, ethereal odor, a burning, sweet taste, neutral reaction; volatile, not inflammable; soluble in 200 of water, freely so in alcohol or ether, also in oils, benzol or benzin. Sp. gr. not below 1.490 at 59° F., or 1.473 at 77° F. Dose, internally, ♏ij–xx, for inhalation ʒss–j, repeated until the desired effect is produced.

Chloroformum Venale, *Commercial Chloroform*, (Unofficial),—is a liquid containing at least 98 per cent. of Chloroform, and having a sp. gr. not lower than 1.470. It contains sundry Hydrocarbons, free Chlorine, Aldehyde and Hydrochloric Acid, and is used only for external applications, or to make the purified article.

Preparations.

Aqua Chloroformi, *Chloroform Water*,—a saturated solution, prepared by agitating an excess of chloroform in distilled water and pouring off the needed quantity of the solution. Dose, ʒss–ʒij.

Emulsum Chloroformi, *Emulsion of Chloroform*,—has of Chloroform 4, Expressed Oil of Almond 6, Tragacanth 1½, Water to 100. Dose, ʒj–℥j.

Spiritus Chloroformi, *Spirit of Chloroform*,—has of Chloroform 6, Alcohol 94. Dose, ♏x–ʒj, well diluted.

Linimentum Chloroformi, *Chloroform Liniment*,—has of Chloroform 30, Soap Liniment 70.

Linimentum Chloroformi Compositum, *Compound Chloroform Liniment*, (Unofficial),—has of Chloroform ℥j, Oil of Turpentine ℥j, Tincture of Opium ℥ss, Tincture of Aconite ʒij.

Chlorodyne, (Unofficial),—is a celebrated secret mixture, put forth by Dr. J. Collis Browne, of London, and since imitated by many others. It contains Morphine, Chloroform, Ether, Cannabis Indica, Hydrocyanic Acid, Capsicum, etc., and is powerfully anodyne, antispasmodic and narcotic, and therefore highly dangerous in non-professional hands. Dose, ♏x–xxx, according to the quantities of Morphine and Chloroform present, these being the active agents in the preparation. A tabular comparison of the principal formulæ which are used in imitation of *Browne's Chlorodyne*, with the formula of the latter preparation itself, is given in the Appendix to this book, and will show the wide differences between them in Morphine strength. A list of 25 formulæ for Chlorodyne was published in the *Therapeutic Gazette* for October, 1883.

Tinctura Chloroformi et Morphinæ (B. P.),—has been made official as a substitute for Browne's Chlorodyne. Each dose of 10 minims contains of Chloroform ♏1¼, Ether ♏⅓, Alcohol ♏¼, Morphine Hydrochlorate gr. 1/48, Dilute Hydrocyanic Acid ♏⅝, Oil of Peppermint ♏1/50, Fluid Extract of Liquorice ♏1¼, Treacle and Syrup q. s.

Tinctura Chloroformi Composita (B. P.),—has of Chloroform 2, Alcohol 8, and Compound Tincture of Cardamom 10. Dose, ♏xx–ʒj.

Anesthetic Mixtures containing Chloroform,—see under ÆTHER, *ante*, page 114.

Some Unofficial Chlorinated Anesthetic Compounds.

Ethylene Bichloride, *Dutch Liquid, Chloric Ether*, $C_2H_4Cl_2$,—is a rapid and powerful anesthetic, probably safer than Chloroform and less so than Ether. It always paralyzes the respiratory centre before the heart, so that its effects may be easily watched and controlled. This is the substance which Guthrie supposed he had obtained when he discovered Chloroform.

Ethylidene Chloride, *Chlorinated Muriatic Ether*, $CH_3,CHCl_2$,—is a mixture of varying sp. gr., and is not inflammable. It closely resembles Chloroform both physically and physiologically, but is less depressant to the heart, consequently safer, and recovery from its effects is very prompt.

Methyl Chloride, CH_3Cl,—a colorless gas, slightly soluble in water, of sweetish odor and taste, inflammable, burning with a greenish flame. Cold liquefies it, and the liquid boils at —7.6° F. It is used locally in neuralgia to produce intense cold, and with remarkable success.

Methylene Bichloride, *Dichloro-methane*, CH_2Cl_2,—is an effective anesthetic which it was supposed would displace Chloroform as being much safer. Dr. Richardson introduced it and Sir Spencer Wells advocated its use, but though little used as compared with other anesthetics several deaths have occurred from its employment. It kills by paralyzing the heart.

Carbon Tetrachloride, CCl_4,—is less irritant than Chloroform, but far more dangerous to the heart.

PHYSIOLOGICAL ACTION.

The action of Chloroform is similar to that of Ether (see *ante*, page 114) with several important differences. It is more irritant to the mucous membranes, and if swallowed undiluted it produces violent gastro-enteritis, which becomes apparent after the subsidence of the profound narcotism which at first follows its ingestion in quantity. A dose of ℥j internally may cause death, though recovery has taken place after the ingestion of one, two and even three ounces (Wood). It clots the blood outside the body, converting it into a mass resembling sealing-wax.

The inhalation of Chloroform produces sensations which are rather agreeable than otherwise, and many persons acquire a liking for it. After a few whiffs the patient experiences noises in the ears and flashes of light before the eyes, also a feeling of weight upon the chest; the heart is felt to be beating wildly and a throbbing sensation is felt in the carotid arteries. In this first stage hysterical symptoms may become manifest, the patient laughing, crying, screaming or swearing. The pulse is at first quite rapid from nervousness, but soon falls in frequency and gains in force. In a short time all sensation of discomfort passes away, the patient becomes quiet, breathes easily, and is evidently comfortable. The consciousness is soon affected, questions being heard but not fully understood, and being answered hesitatingly and slowly and in an irrelevant manner. After a brief period of repose there may be another spell of excitement, during which the patient may struggle and endeavor to get up; but this soon passes away, and the muscles, which were contracted, become flaccid, and the patient gradually assumes a condition of complete insensibility. In this state all reflex action is abolished and pain is not experienced; the pupils are contracted, and the limbs, when raised and let go, fall heavily. Dangerous symptoms are:—(1) respiration becoming stertorous or shallow, (2) sudden dilatation of the pupils, (3) signs of cardiac failure.

As compared with Ether the inhalation of Chloroform is less stimulating, much more depressant to the vital functions, and much more dangerous on account of its direct paralyzant action on the heart. Its vapor is less irritant to the air-passages, uninflammable, more agreeable, more prompt in action, produces much less subsequent vomiting, a shorter stage of excitement and a more profound degree of narcosis; and should be diluted with 96½ per cent. of air to produce anesthesia with safety, according to the general teaching on this subject. Its mortality is much greater, being about 1 in 5,600, against one in 13,000 for Ether, and fatal cases continue to be reported, though none of these have occurred in obstetrical practice.

The Hyderabad Chloroform Commission's investigations, conducted under the direction of Dr. T. Lauder Brunton, led to the conclusion that Chloroform and Ether act in the same manner upon the heart and respiration, both paralyzing the respiratory centre before the heart, and Chloroform acting more quickly and powerfully than Ether in both directions. Prior to this investigation it was taught that death from Chloroform is almost always sudden and occurs by cardiac paralysis, while from Ether it is slow and usually by paralysis of respiration. The subsequent researches of Gaskell, McWilliam and others tend to sustain the latter view, and show that the verdict of the commission cannot be accepted as conclusive. There is very little doubt but that Chloroform may paralyze the heart without first affecting the respiration; and it is probable that the paralysis of the vaso-motor centre, and the consequent withdrawal of blood from the heart and brain to the dilated splanchnic area, may be an important factor of a fatal result. Chloroform undoubtedly exerts a powerful depressant action on the heart. Injected into the jugular vein it instantly arrests the cardiac action, and destroys its muscular irritability. Its vapor, applied to the exposed heart, paralyzes it, and even when artificial respiration is maintained the effect is very apparent. There can be no doubt but that Chloroform destroys the contractile power of the cardiac muscle (Murrell).

At a certain stage of chloroform anesthesia women often exhibit marked signs of sexual excitement, and on recovery it is not uncommon for them to bring charges of improper conduct against some one present, with no false intention but in the belief that impropriety actually occurred. It is never safe to administer an anesthetic to a woman without the presence of a third party (Murrell).

For the modes of dying from anesthesia see under the title ÆTHER, *ante*, page 115.

Treatment of Chloroform Poisoning.

There is no chemical antidote, and if the drug has been swallowed the stomach should be evacuated and the case treated as one of irritant poisoning. *Oxygen* or *Amyl Nitrite* may then be given by inhalation, and *Strychnine* or *Atropine* hypodermically to sustain the heart. Artificial respiration should be used as soon as possible.

In cases of danger from Chloroform inhalation prompt measures must be taken. The tongue should be pulled out with forceps and kept out. The doors and windows should be thrown open so as to produce a current of fresh air, but care must be taken that the body is not cooled thereby. The face and chest should be slapped with a wet towel, and *Artificial Respiration* should be commenced at once and kept up for some time, not faster than 20 to the minute. A succession of quick, sharp blows on the chest, over the cardiac region, will sometimes provoke the heart to renewed action after it has apparently failed. *Venesection* is wrongly neglected in such cases; it relieves the right cardiac engorgement, which is so constantly found at the autopsy. *Galvanism* may stimulate the heart into action. *Atropine* hypodermically has rendered excellent service in several cases in the author's experience. *Strychnine* is considered antagonistic by many authorities, and has been used with good results. *Oxygen* is the best antagonist of all (Sayre).

THERAPEUTICS.

Chloroform has a large field of therapeutic action besides its use as an anesthetic. It is frequently employed in liniments as a rubefacient and anodyne application, also to promote the passage of other agents through the epidermis, and to relieve itching. The vapor may be directed onto the raw surface of an ulcer or a superficial burn in order to relieve pain; and that arising from a few drops placed in the hand and held close to the eye will relieve photophobia. Internally it is administered with great benefit in vomiting, colic, dysmenorrhea, and cholera morbus; also in true cholera, in which disease it has probably been more efficient than any other single remedy, and in gastric ulcer, gastralgia and other painful affections of spasmodic character. In three to ten drop doses well diluted it markedly improves all the functions of the stomach, and is a valuable remedy for many gastric disturbances, especially acute dyspepsia. In sciatica, tic-douloureux and other neuralgiæ of important nerves the deep injection of ♏ v–xv of pure Chloroform in the vicinity of the nerve is highly recommended, though it may cause dangerous local disturbance. In several cases of severe supra-orbital neuralgia, the writer has injected two or three minims of Chloroform into the vicinity of the supra-orbital nerve just above its foramen of exit, with the most gratifying permanent results, though severe local pain and considerable swelling were experienced for several days.

The vapor of Chloroform inhaled in small quantities from warm water or from a handkerchief is a very useful remedy in many neuroses, as hay-fever, spasmodic asthma and reflex cough. It is one of the best palliatives in the cough of phthisis, as was long ago pointed out by Spencer Wells. It may be used with much benefit as a pulmonary antiseptic in many affections of the air-passages, as acute nasal catarrh, influenza and bronchitis; and has promptly checked a severe case of catarrh extending into the antrum and causing great pain. Carried to the production of muscular relaxation it is often used as an aid to diagnosis, especially in cases of malingering, in suspected disease of the abdominal viscera, and to aid in reducing dislocations and herniæ. It is used with great benefit in parturition, decreasing the sensibility to pain, relaxing the passages, and easing the labor, while it does not interfere with the uterine contractions, or predispose to inflammation, hemorrhage or convulsions. In such cases the quantity needed is very small, a few whiffs from time to time being quite sufficient. In some cases, as in acute mania, a patient may require to be kept under the influence of chloroform for a long time, —for hours, days, or even weeks; and this has been done in the digital treatment of subclavian and other aneurisms. The writer, on one occasion, kept an insane woman continuously under its influence for a period of three weeks, except during the time necessary for taking food.

For the production of complete anesthesia the use of Chloroform is steadily decreasing in favor of Ether, except for young children and in obstetrical practice. Its vapor being four times denser than air, and the rule for its effective use requiring fully 96½ per cent. of air with it, its administration according to the orthodox fashion, requires most careful management, and should never be attempted in any but the recumbent posture. An ounce of Brandy and a hypodermic injection of Morphine, gr. $\frac{1}{4}$, with Atropine, gr. $\frac{1}{120}$, given 20 minutes before commencing the inhalation, are means of great utility in sustaining the heart and respiration, as well as in rendering the anesthesia more profound. No operation, especially on parts supplied by the fifth nerve, should be undertaken during partial chloroform anesthesia, for the reasons given on page 115. For the Schleich method with a mixed anesthetic see under ÆTHER, *ante*, page 117.

Dr. Luckett, of Mt. Sinai Hospital, New York, in ten years administered chloroform in 4,263 cases with but one death, and ether in 4,673 cases with no death. Syme administered chloroform in 5,000 cases without a single death, and ascribed this excellent record to his adherence to the following rule: "Never mind the pulse, never mind the heart, leave the pupil to itself, but keep your eyes on the breathing, and if it becomes embarrassed to a grave extent, pull the tongue well out with an artery forceps." The Edinburgh rule is practically this: "Watch the respiration, the heart will take care of itself"; but Professor Stewart suggests that a second one should be inculcated, namely—"Watch both the breathing and the pulse; and if the heart threatens to fail for want of blood, fill it by raising the legs and compressing the abdomen."

The elder Sayre administered Chloroform in a manner which would startle an uninitiated observer who is impressed by the orthodox rule of 96½ per cent. of air with 3½ per cent. of the anesthetic as the only safe proportion. Having been made familiar with the practice of Dr. Sayre through observance of his methods as employed by some of his pupils, the writer sought for more direct instructions from that distinguished surgeon, and received from him a letter from which the following paragraphs are extracted:—

"I have employed no other method for more than twenty years, have used it in this manner in some thousands of cases without the least appearance of danger, and can therefore speak with confidence as to its safety.

"My plan is simply to anesthetize the patient with the *smallest amount of Chloroform possible;* and as *Oxygen* is the *Antidote* to the anesthetic I *exclude all air* that is *not impregnated with the anesthetic.*

"In this manner a very few inspirations will produce immediate anesthesia without the muscular struggling which always follows when pure air is admitted with the chloroform. I always measure my dose with the same care as if I were administering Arsenic, Strychnine, Corrosive Sublimate, or any other potent agent; and then I know what I am doing. If by accident there should be some peculiarity about the patient, making him unduly susceptible, a few artificial respirations would soon remove the influence of the few drops which had been inhaled, and thus all danger can be avoided. Five, ten, or twenty drops of Chloroform administered in this manner is all that is requisite to produce immediate and profound anesthesia. I have explained my method hundreds of times at my clinical lectures in Bellevue Hospital, many of which have been published at different times in different medical journals by various persons who have made stenographic reports of my lectures. In the 'Transactions of the International Medical Congress,' held in Philadelphia in 1876, is a verbatim report of my remarks on this subject made while I was performing an exsection of the hip-joint in the hospital before the Congress."

CHLORUM, Chlorine, Cl,—is a greenish-yellow gas having a suffocating odor, belonging to the *Halogen* group of elements; and though not official itself, it is represented in medicine by several of its compounds, as well as by several preparations which furnish it.

The so-called *Halogen Elements* derive their title from ἅλς, the sea,—because the most important members of the group are obtained, directly or indirectly, from the ocean, viz.: *Chlorine*, from sea-salt; *Bromine*, from sea-water; and *Iodine*, from sea-weed. They are all noted for their affinity for hydrogen, and consequent power as decomposers of organic matter.

Chlorine Compounds, described under the titles of their respective metallic bases, are—the *Chlorates* of Potassium and Sodium; the *Chlorides* of Ammonium, Calcium, Potassium, Sodium, Mercury, Gold, Iron, Zinc, etc.;—also *Hydrochloric Acid*, classed with the mineral acids (see page 97), and Chloral. Croton-chloral, and Chloroform.

Preparations.

Aqua Chlori, *Chlorine Water*,—is an aqueous solution of Chlorine, containing at least 0.4 per cent. of the gas; and is prepared by heating together Manganese Dioxide 10 parts and Hydrochloric Acid 35, then saturating 400 of distilled water with the gas so obtained. It is a clear, greenish-yellow liquid, of suffocating odor and disagreeable taste. Dose, ʒj–℥ss, well diluted, as a lotion or spray; internally, ♏x–xx, in water. Chlorine Water may be extemporaneously prepared by mixing in a mortar Chlorate of Potassium 40 grains and Hydrochloric Acid ½ ounce, and adding a pint of distilled water by agitation during the evolution of the vapors. If done in a closed vessel danger may arise from the explosive gas, Cl_2O_4, which is liberated at the same time. It should be quickly bottled.

Calx Chlorata, *Chlorinated Lime, Chloride of Lime*,—is a compound resulting from the action of Chlorine upon Calcium Hydrate, and containing at least 35 per cent. of available Chlorine. It is obtained by exposing slaked Lime to the action of Chlorine gas as long as the latter is absorbed, and should not be confounded with Calcium Chloride (see *ante*, page 234). It occurs as a whitish, dry powder or in friable lumps, gradually decomposing in the air, of saline, disagreeable taste, and a feeble Chlorine odor, partially soluble in water and in alcohol, and when dissolved in dilute Hydrochloric acid gives off Chlorine gas. Dose, gr. iij–vj in water; for external use a 1 to 3 per cent. solution. *Liquor Calcis Chloratæ*, B. P., is a solution of 1 pound in 1 gallon of water.

Liquor Sodæ Chloratæ, *Solution of Chlorinated Soda, Labarraque's Solution*,—a pale-greenish liquid, of faint chlorine odor, and alkaline taste and reaction; prepared by adding together watery solutions of Sodium Carbonate 150, and Calx Chlorata 75, each in water, then adding water up to 1000. Is an aqueous solution of several chlorine-compounds of sodium, containing at least 2.6 per cent., by weight, of available chlorine. Dose, ♏x–ʒj in 20 parts of water.

PHYSIOLOGICAL ACTION.

In the presence of moisture Chlorine is one of the most powerful of disinfectants and deodorants, and an antiseptic and antifermentive agent of the highest activity; its power in these respects being due to its affinity for hydrogen, decomposing all bodies which contain hydrogen as a molecular constituent, forming hydrochloric acid and setting oxygen free in its nascent form (ozone). Administered internally, it is converted, on reaching the stomach, into hydrochloric acid and chlorides, losing all action on the organism in its own character. Locally applied, it is irritant to the skin and mucous membranes, producing a sense of heat, with burning sensations and even vesication. Inhaled in any quantity, it causes cough, sneezing, and spasm of the glottis, also inflammation of the mucous lining of the air-passages and of the lungs.

Antidotes.

Ammoniacal Vapors inhaled after Chlorine to form Ammonium Chloride. Ammonium Sulphide has a similar reaction, but should be inhaled in great moderation. *Albumin* is the antidote if Chlorine preparations have been taken into the stomach, and a little Aqua Ammoniæ, sufficiently diluted, may also be administered with advantage.

THERAPEUTICS.

The Chlorinated preparations are used as disinfectants and deodorizers of rooms, drains and discharges from the body. They are rarely used about the person or clothing of patients by reason of the irritation produced by them when inhaled, and their power to destroy the color of fabrics. In dilute solution they are well employed as local applications in aphthæ, gangrene, scarlet fever and diphtheria, in which their principal action is to destroy fetor. The same may be said of their use in sloughing ulcers and gangrenous wounds, foul discharges, etc., as they are rarely employed about the person in sufficient strength to have any destructive effect on disease-germs. A strong solution of Chlorinated Soda is a good application to bites of serpents and insects, to wash the hands after contact with infectious material, and to prevent infection by the syphilitic poison. A combination of Potassium Chlorate and Tinctura Ferri Chloridi makes a solution of Chlorine, Euchlorine, Potassium Chloride and Ferric Chloride when diluted with water, and gives one of the best and most innocuous solutions of antiseptics. It makes an excellent gargle for sore throats, simple or diphtheritic. Glycerin should never be added to it, as the resulting mixture will be liable to explode violently. These preparations have been administered internally in septic diseases, low fevers, etc., but without producing any marked beneficial results, except in diphtheria, for which disease the internal administration of Chlorine Water diluted has many advocates among practicing physicians.

Chlorine gas is a powerful local stimulant, and has been used with great benefit to promote healing in old ulcers. Absorbent cotton may be exposed to the gas extemporaneously prepared as directed on page 266, and bandaged on the surface of the ulcer. Chlorine inhalations were used forty years ago, by Sir James Simpson and others, in phthisis pulmonalis, with apparent benefit.

Chlorinated Lime, freshly prepared, in solutions of varying strength, from 1 in 60 to 1 in 12, is used by hypodermic injection in Australia as an antidote to serpent venom. The solution is injected into several points above the wound, 20 to 100 minims being inserted at each place.

In some cases this procedure causes great pain, but it does not seem to induce any local inflammation, and it is highly efficient for the purpose for which it is used. A common method of disinfecting a sick-room is to place a pound of Chlorinated Lime into a canvas bag and immerse it in a mixture of common Hydrochloric Acid, 1½ pint, and Water 4½ pints, allowing it to remain for 24 hours. A still better method is to mix common salt, Manganese Dioxide and Sulphuric Acid in a saucer. The Chlorine generated is heavier than atmospheric air, so that the vessel should be placed on a high shelf and not on the floor, in order that it may be diffused throughout the room.

CHRYSAROBINUM, Chrysarobin,—is a mixture of proximate principles extracted from *Goa-powder*, a substance found in cavities formed by decay in the wood of the trunk of *Andira Araroba*, a Brazilian tree of the nat. ord. Leguminosæ. It is commonly misnamed "Chrysophanic Acid" (one of the constituents of Rheum)—though easily converted into that substance. Occurs as an orange-yellow powder, odorless and tasteless, nearly insoluble in water and in alcohol, but readily soluble in ether, solutions of alkalies and sulphuric acid. Dose, gr. ⅛.

Unguentum Chrysarobini, *Chrysarobin Ointment*,—Chrysarobin 5, Benzoinated Lard 95 parts. Should be diluted for average use from 1 to 3 times.

In 20-grain doses Chrysarobin is a gastro-intestinal irritant, producing large, watery, bilious stools, with repeated vomiting but not much nausea. Locally it produces diffuse dermatitis, often followed by follicular and furuncular inflammation. It stains the skin a dark yellowish-brown color, which may be removed by a weak solution of chlorinated lime. The use of this remedy is confined to superficial parasitic skin diseases of vegetable origin, and for psoriasis, in the latter affection being the best remedy known. It may be used in weak ointment locally, and internally in ⅛-grain doses.

CIMICIFUGA, Black Snake-root, *Black Cohosh*,—is the rhizome and roots of *Cimicifuga racemosa*, a plant of the nat. ord. Ranunculaceæ, native in the United States. It contains a *Volatile Oil* when fresh, resin, tannic and gallic acids, also an acrid, crystallizable, neutral principle. *Cimicifugin* or *Macrotin* is an impure resin obtained by precipitation from a concentrated tincture by the addition of water. The active principle has not been isolated.

Preparations.

Extractum Cimicifugæ, *Extract of Cimicifuga*.—Dose, gr. j–v.
Extractum Cimicifugæ Fluidum, *Fluid Extract of Cimicifuga*.—Dose, ♏v–xx.
Tinctura Cimicifugæ, *Tincture of Cimicifuga*,—20 per cent.—Dose, ♏x–ʒj.
Macrotinum, *Macrotin*, (Unofficial).—Dose, gr. ss–ij.

PHYSIOLOGICAL ACTION.

Cimicifuga is stomachic, antispasmodic, aphrodisiac, diaphoretic, diuretic and expectorant. Its taste is bitter and nauseous, resembling that of Opium. It acts on the heart and circulation similarly to Digitalis, and on unstriped muscular fibre like Ergot, but is much feebler in activity than either of these agents. Small doses stimulate digestion and secretion, the generative function and the menstrual flow, and especially the secretions of the bronchial mucous membrane and the kidneys. Full doses slow the heart while increasing its force, raise arterial tension and stimulate uterine contraction. Large doses dilate the pupils and produce dimness of vision, vertigo, intense headache, nausea, vomiting, and in some persons soporific and anodyne effects.

THERAPEUTICS.

Cimicifuga closely resembles Digitalis in action, but it is safer, and should be more frequently used when the latter drug is indicated. In cardiac diseases it is very efficient, especially in weak or fatty heart where Digitalis would be dangerous. It is a good stomachic tonic, particularly in the irritable dyspepsia of alcoholism. As an expectorant it is used in acute and chronic bronchitis. It is a good nerve tonic in delirium tremens, and in functional impotence it is often efficient. In rheumatoid arthritis and rheumatism of the localized muscular variety, as lumbago, torticollis, intercostal rheumatism, etc., it is one of the most efficacious remedies, having a strong affinity for the muscular system. Neuralgias of various kinds are benefited by it, particularly ovarian neuralgia. Chorea about the age of puberty is one of the affections in which it is most useful, and the same may be said of the hysterical form of this disease.

Many uterine disorders are remarkably benefited by Cimicifuga, such as amenorrhea, neuralgic and congestive dysmenorrhea, subinvolution, spinal irritation due to some obscure sympathetic or neuralgic affection of the womb, sympathetic pains and neuralgiæ arising from the so-called irritable womb, passive menorrhagia, etc. In obstetrics it gives excellent results when used to initiate uterine contractions, to check hemorrhage, and to allay afterpains and nervousness after delivery. In puerperal mania and peritonitis its good effects are frequently remarkable, and in puerperal hypochondriasis it is strongly recommended by very high authority.

CINCHONA, Peruvian Bark.—The Cinchona tree belongs to the nat. ord. Rubiaceæ and is a native of the eastern slope of the Andes, but has been largely planted in India, Ceylon, Java and Burmah, with the result of improving the quinine-yielding value of many species by cultivation. In late years the test of appearance has given way to that of assay in judging of the various barks of commerce, and only those are official which yield 5 per cent. of total alkaloids of which at least 2½ per cent. must be Quinine. Yellow bark contains most Quinine (as high as 9 per cent. having been obtained from one specimen), pale bark contains most Cinchonine and least Quinine, while red bark contains these alkaloids in about equal proportions. The Columbian varieties afford the largest percentage of Cinchonidine. The official species are :—

Cinchona, *Cinchona*,—the bark of *Cinchona Calisaya, Cinchona officinalis*, and of hybrids of these and of other species of Cinchona, yielding, when assayed by a prescribed process, not less than 5 per cent. of total alkaloids, and at least 2½ per cent. of Quinine.

Cinchona Rubra, *Red Cinchona*,—is the bark of *Cinchona Succirubra*, containing not less than 5 per cent. of its peculiar alkaloids. From it is prepared the Compound Tincture of Cinchona.

Bark may be administered in doses of gr. x–ʒj, but it is never used now in substance, being bulky and very disagreeable to the taste.

The principal varieties of the sub-order Cinchoneæ, the barks of which are found in commerce and are used by manufacturers of the alkaloids, are—*Cinchona Calisaya*, Cinchona Flava, Yellow Bark, from Peru, Bolivia and India; *C. Succirubra*, Red Bark, from Ecuador, Java and Ceylon; *C. Condaminea*, Pale Bark, from Ecuador and Peru; *C. Pitayensis*, Pitaya Bark, from New Granada; *C. Micrantha*, Gray Bark, from Peru and Bolivia. Altogether there are some 31 species acknowledged by botanists, and the list is constantly increasing, from the tendency of the different trees to hybridize. Several trees formerly acknowledged as Cinchonas are now placed in the genus Cascarilla, but their barks are to be found on the market. Cuprea bark is from trees of the genus Remijia, growing in Columbia; it contains Quinine and a peculiar alkaloid, *Cinchonamine*, but no Cinchonidine.

Composition of Cinchona.

Cinchona bark contains 21 natural alkaloids (of which 4 are official), 8 artificial alkaloids, 2 simple acids, 2 tannic acids, a resinoid and a coloring matter, as follows:—

Quinine, $C_{20}H_{24}N_2O_2$,—a strong base, fluorescent, the most valuable of all the alkaloids; heated with glycerin to 374° F., it is converted into the isomeric base, *Quinicine*.

Quinidine, $C_{20}H_{24}N_6O_2$,—isomeric with Quinine, fluorescent, probably the most powerful as an antiperiodic, but existing in very small quantity.

Cinchonine, $C_{19}H_{22}N_2O$,—the least active of the official four, having about half the therapeutic power of quinine. Not fluorescent.

Cinchonidine, $C_{19}H_{22}N_2O$,—isomeric with Cinchonine, not fluorescent, one of the most powerful of the alkaloids.

The other alkaloids are of no interest medicinally.

Kinic and Kinovic Acids,—are combined in the bark with the alkaloids. The former is used to make a Kinate of Quinine, and the latter occurs in non-official pharmacy as Kinovate of Lime, an ingredient in Deloudre's Extract, which is used in Europe and India for dysentery.

Kino-tannic and Kinovo-tannic Acids,—give to bark its peculiar and powerful astringent qualities. They have not been fully studied.

Kinovin,—is a bitter, amorphous resinoid, which is resolvable into Kinovic Acid and sugar. It is soluble in alcohol, but not in water.

Cinchona Red,—a reddish-brown, insipid, inodorous substance.

Preparations of the Bark.

Extractum Cinchonæ, *Extract of Cinchona*.—Dose, gr. j–v.

Extractum Cinchonæ Fluidum, *Fluid Extract of Cinchona*.—Dose, ♏x–ʒj.

Tinctura Cinchonæ, *Tincture of Cinchona*,—has of Cinchona 20, in Alcoh 67½, Water 25 and Glycerin 7½. Dose, ʒss–ij.

Tinctura Cinchonæ Composita, *Compound Tincture of Cinchona*,—has of Red Cinchona 10, Bitter Orange Peel 8, Serpentaria 2, in Alcohol 85, Water 7½ and Glycerin 7½; and is intended to replace Huxham's Tincture of Bark (see below). Dose, ʒj-iv.

Infusum Cinchonæ, *Infusion of Cinchona*,—has of Cinchona 6, Aromatic Sulphuric Acid 1, Water to 100. Is the only official infusion containing this acid. Dose, ʒj-℥j.

Huxham's Tincture of Bark, 1788 (Unofficial), is still used. Red Cinchona ℥iv, Orange-peel ℥iij, Serpentaria gr. lxxx, Spanish Saffron gr. clx, Cochineal gr. lxxx, Brandy ℥xl, digested for 4 days, expressed and filtered. Dose, ʒss-ij.

Quinine and its Salts.

Quinina, *Quinine*, $C_{20}H_{24}N_2O_2 + 3H_2O$,—a white, amorphous or minutely crystalline powder, of alkaline reaction and very bitter taste, soluble in 1670 of water and in 6 of alcohol at 59° F., in 23 of ether, 5 of chloroform, and readily in dilute acids. Dose, gr. j-xx, or xl in special cases. Is insoluble in saliva.

Quininæ Sulphas, *Quinine Sulphate*, $(C_{20}H_{24}N_2O_2)_2.H_2SO_4 + 7H_2O$,—very light, snow-white, fragile crystals, of very bitter, persistent taste, soluble in 740 of water and in 65 of alcohol at 59° F., in 30 of boiling water, 3 of boiling alcohol, also in acidulated water. Dose, gr. j-xx, or even gr. xl in special cases.

Quininæ Bisulphas, *Quinine Bisulphate*, $C_{20}H_{24}N_2O_2.H_2SO_4 + 7H_2O$,—clear, colorless, efflorescent crystals or small needles, of very bitter taste and strongly acid reaction, soluble in 10 of water with blue efflorescence, and in 32 of alcohol, in 59° F. Dose, gr. j-xxx, or even gr. lx in special cases.

Quininæ Hydrobromas, *Quinine Hydrobromate*, $C_{20}H_{24}N_2O_2HBr + H_2O$,—colorless needles, of very bitter taste, soluble in 54 of water and in 0.6 of alcohol at 59° F., very soluble in boiling water and in boiling alcohol. Dose, gr. j-xx.

Quininæ Hydrochloras, *Quinine Hydrochlorate*, $C_{20}H_{24}N_2O_2HCl + 2H_2O$,—white needles in tufts, of very bitter taste, soluble in 34 of water and in 3 of alcohol at 59° F., in 1 of boiling water or alcohol. Is used hypodermically. Dose, gr. j-xx. An excellent salt which should be more generally used; 5 to 10 gr. doses are antipyretic.

Quininæ Valerianas, *Quinine Valerianate*, $C_{20}H_{24}N_2O_2C_5H_{10}O_2 + H_2O$,—white, pearly crystals, of valerianic odor and bitter taste, soluble in 100 of water and in 5 of alcohol at 59° F. Dose, gr. j-iij. It is supposed to be the only salt of Quinine affected by the constituent acid.

Quininæ Hydrochloras Carbamidata, *Quinine Carbamide Hydrochlorate* (Unofficial),—is a new compound salt of Quinine and Urea, soluble in equal parts of water and therefore admirably adapted for hypodermic administration in a 50 per cent. solution. It is almost unirritating to the tissues, and is given subcutaneously in doses of gr. j-iij.

Chininum Amorphum Boricum, *Amorphous Quinine Borate* (Unofficial),—is a new preparation, soluble in an equal quantity of water, and claimed by its introducers to be as satisfactory as any Quinine salt, and better borne by the stomach than any other. It is said to cause little or no congestion of the membrana tympani.

Euquinine, *Quinine Ethyl-carbonate* (Unofficial),—the ethyl-ether of quinine-carbonic acid, is said to be as efficient as quinine in malarial fever, with the advantage of being tasteless in substance, though decidedly bitter in solution. Dose, gr. v-xv.

Tinctura Pyrexialis, *Tinctura Antiperiodica*, *Warburg's Tincture* (Unofficial),—is a celebrated and formerly secret preparation. The formula, published in 1875 by the originator, includes 16 ingredients, one of which (Confectio Damocratis, see page 568) contained many drugs which are not now attainable. The tincture contained Quinine Bisulphate, 2 per cent., with Aloes, Rhubarb, Camphor and several aromatic herbs. Dose, ℥j (about 9½ grains of Quinine Bisulphate) in 2 doses given 3 hours apart. Hager's modification of the original formula is—Quinine Sulphate 1, Spt. Camphoræ 2, Tinct. Aloes et Myrrhæ 22, Alcohol 16. Dose, as above. Some of the preparations now sold under this name contain few, if any, of the original ingredients. The so-called *Warburg's Pill* is a most irrational form in which to administer this complex medicine, even if it contains the proper constituents.

Other Official Alkaloids and their Preparations.

Cinchonina, *Cinchonine,* $C_{19}H_{22}N_2O$,—white, lustrous prisms or needles, of bitter after-taste, almost insoluble in water, readily so in dilute acids and in 116 of alcohol at 59° F. Dose, gr. j–xxx or more.

Cinchoninæ Sulphas, *Cinchonine Sulphate* $(C_{19}H_{22}N_2O)_2H_2SO_4 + 2H_2O$,—white, shining prisms, of very bitter taste, soluble in 66 of water and in 10 of alcohol at 59° F., and readily soluble in dilute acids. Dose, gr. v–xxx or more.

Cinchonidinæ Sulphas, *Cinchonidine Sulphate* $(C_{19}H_{22}N_2O)_2H_2SO_4 + 3H_2O$,—white, silky crystals, of bitter taste, soluble in 70 of water and in 66 of alcohol at 59° F., freely soluble in acidulated water. Dose, gr. j–xx or more.

Quinidinæ Sulphas, *Quinidine Sulphate* $(C_{20}H_{24}N_2O_2)_2H_2SO_4 + 2H_2O$,—white, silky needles, of bitter taste, soluble in 100 of water and in 8 of alcohol, readily in acidulated water, at 59° F. Dose, gr. j–xx or more. It is not so bitter as Quinine, is less expensive, and is a valuable antipyretic and antiperiodic.

Unofficial Preparations.

Chinoidinum, *Chinoidin, Quinoidin,*—a mixture of alkaloids, mostly amorphous, obtained as a by-product in the manufacture of the crystallizable alkaloids from Cinchona. A black solid when cold, plastic when warmed, of bitter taste, almost insoluble in water, freely soluble in alcohol and in dilute acids. It contains the 4 alkaloids in amorphous condition, and has about ½ the therapeutic power of Quinine. Dose, gr. v–xxx or more.

Quinquinina, *Quinetum,*—is an Indian preparation containing the total alkaloids extracted from bark by acidulated water, then precipitated by soda and dried. In India it is called "febrifuge."

Cinchonidinæ Salicylas, *Cinchonidine Salicylate,*—has anti-malarial power only inferior to that of the salts of Quinine.

SUBSTITUTES FOR QUININE.

The synthetical production of Quinine has been the "philosopher's stone" of the modern chemists, who have prosecuted with untiring energy the search for an artificial product possessing all its properties. Though in this they have as yet been unsuccessful, they have discovered several organic bodies, which closely resemble each other and also quinine, both in chemical constitution and physiological action. These substances belong to the aromatic series of carbon compounds, all of which are derivates of *Benzene* or *Benzol,* C_6H_6, the hydride of the organic radicle *Phenyl,* C_6H_5. The distinctive action of the lower members of this series is their *antiseptic* and *antipyretic* powers,—as that of the fatty series of carbon compounds is *stimulant* and *anesthetic* (Brunton). Many of these agents are obtained from coal-tar oil (petroleum) by fractional distillation, etc., and they are all derivatives of Benzene (Benzol), either directly or from some one of the products formed therefrom by substitution, various radicles replacing the different constituent atoms of H and C.

Thus by the ring-arrangements of atoms peculiar to this series, there are formed from Benzene (C_6H_6), the following substances, viz.:—

Phenol, or *Carbolic Acid,* C_6H_5OH—by replacing H by OH (hydroxyl).
Pyrocatechin, or *Ortho-* $C_6H_4(OH)_2$.
Resorcin, or *Meta-* *dioxybenzol,*—by replacing 2H by 2OH.
Hydroquinone, or *Para-* $C_6H_4(OH)_2$.

Pyrogallol, Pyrogallic Acid, Tri-hydroxybenzene, $C_6H_3(OH)_3$,—3H by 3OH.
Amido-benzene, or *Anilin,* $C_6H_5.NH_2$—by replacing H by NH_2 (amidogen).
Nitro-benzene, $C_6H_5.NO_2$—by replacing H by NO_2 (nitroxyl).
Benzoic Acid, $C_6H_5CO.OH$—by replacing H by CO.OH (carboxyl).
Salicylic Acid, $HC_7H_5O_3$—by replacing 2H by OH and CO.OH.
Naphtalin, $C_{10}H_8$—by uniting two Benzenes in an over-lapping ring.
Pyridine, C_5H_5N—by replacing tetrad C by triad N.
Chinolin, C_9H_7N—by uniting Benzene (C_6H_6) and Pyridine (C_5H_5N).

Derived from Chinolin is the hypothetical base—
Chinicin or *Quinicin,* $C_9H_9N_2$,—represented in Antipyrin.
Also *Kairin, Thallin,* and other compounds.

The most important of these are Antipyrin, Acetanilid, Resorcin, Chinolin and Naphtalin, which are respectively described in separate articles. Others of the same class are the following, viz.:—

Some Unofficial Antipyretics.

Kairinum, *Kairin* (*Hydrochlorate of Oxy-ethyl-chinolin-hydride*), $C_{10}H_{13}NO.HCl.H_2O$,—is an artificial alkaloid prepared from Chinolin, belonging to the phenol group of carbon compounds, and a powerful antipyretic in 8-grain doses hourly. It stains the urine a deep green, and has not proven fatal though 220 doses have been administered in one case. In some cases of typhus it has caused cyanosis and collapse. It produces profuse sweating and vomiting, and the subsequent rise of temperature after its antipyretic influence has worn off is generally ushered in by a severe rigor. It occurs in white crystals, which are freely soluble in water, but is best given in wafer paper, or capsules. Dose, gr. iij–xxx.

Kairolinum, *Kairolin* (*Sulphate of Tetra-hydromethyl-chinolin*),—is antipyretic, but much less efficient than Kairin.

Thallin, *Tetra-hydro-parachinanisol,*—is a synthetically prepared substance, having also another chemical name, *Tetra-hydro-paramethyl-oxy-chinolin.* It occurs as a colorless powder which is soluble in water, and enters into combination with acids, forming salts, of which the tartrate and sulphate are the most eligible, especially the latter. The dose of Thallin or its Sulphate ranges from gr. ij to gr. xv, a mean average dose being about 5 grains, given in the form of compressed tablets. Thallin is an antipyretic of very great power, doses of 5 to 12 grains lowering the temperature in typhoid fever 4° to 5° in 2 hours' time, the effect lasting nearly 3 hours. In tuberculosis similar results were obtained. Large doses, however, produce very profuse sweating and a dangerous degree of depression; so that this agent is not a favorite remedy for hyperpyrexia.

Hydroquinone, *Para-di-hydroxy-benzene,* $C_6H_4(OH)_2$,—is isomeric with Resorcin (see *ante,* page 272). It crystallizes in rhombic, colorless prisms which are slightly soluble in water, readily so in alcohol and in ether. It is obtained from *Arbutin,* a glucoside constituent of Uva Ursi and other Ericaceæ, by hydrolysis; also from *Anilin* by oxidation with chromic acid mixture and subsequent reduction of the Quinone thus formed by sulphurous acid. It is an efficient antipyretic, without injurious effects so far as observed, but its influence is only temporary. Dose, as an antipyretic, gr. xv–xx, best given in alcohol. Gr. xl have been given without disagreeable effects.

Pyrocatechin, *Catechol* (*Ortho-di-hydroxy-benzene*), $C_6H_4(OH)_2$,—is also isomeric with Resorcin, and is one of the acid constituents of coal-tar, but is also obtained from wood-tar and from kinic acid. It is a good antipyretic, but much inferior to Quinine or Resorcin, and its use has been abandoned on account of its by-effects.

PHYSIOLOGICAL ACTION.

Cinchona is an astringent bitter and a stomachic tonic. At first it promotes appetite, digestion, the flow of saliva and of gastric juice; long continued it sets up a gastric catarrh, impeding digestion and causing constipation. The action of Cinchona in sufficient dose is generally that of its alkaloid Quinine, except that the bark is decidedly astringent, more of a gastric irritant, and its active principles are more slowly absorbed by reason of its bulk. In large doses (ʒij) the powdered bark has produced flatulence and eructation, and in many well-authenticated instances has apparently caused a well-marked febrile paroxysm, beginning with chill, then fever and headache, which gradually subsided with slight perspiration. So also, Quinine, while incapable of producing intermittent fever in a healthy person, may, if taken in large doses unnecessarily, throw the nervous system into high commotion, and if untimely used by a malarial subject may reproduce the paroxysm with greater or less severity.

Quinine is a bitter tonic, antiseptic, antiperiodic and antipyretic, a diminisher of reflex action, a protoplasmic poison and a cardiac depressant. It is rapidly diffused and slowly excreted, being found in the urine in 15 minutes after its administration and for two or three days afterwards. Occasionally it produces renal and vesical irritation. Its action on the stomach is similar to that of cinchona. It arrests the movements of the white blood-corpuscles though increasing their number, and prevents acetification and decay of the blood. It is actively destructive of lowly organized life, a solution of 1 in 500 being fatal to infusoria and fungi, while one of double this strength prevents alcoholic fermentation and checks putrefactive decomposition. The heart and arterial tension are somewhat stimulated by small doses, but depressed by large ones (gr. xl–lxxx), which slow and enfeeble the pulse by direct action on the cardiac ganglia. The brain is rendered hyperemic and exhilaration is caused by small or moderate doses, and large ones produce a train of congestive cerebral symptoms, including a sense of fulness and constriction in the head, tinnitus aurium, vertigo, staggering gait, amblyopia and deafness, great headache, dilated pupils, delirium, coma, and in animals convulsions. The eyes and ears, though suffering severely, are rarely injured permanently. The foregoing symptoms are collectively termed *Cinchonism*.

Quinine reduces the size of the spleen when enlarged, and lowers the temperature of pyrexia by lessening oxidation, though it does not depress the body-temperature in health. Large doses lower the reflex function of the spinal cord. In some subjects it produces sexual excitement, in others cutaneous eruptions sometimes followed by desquamation. It lessens the excretion of uric acid but not that of urea, and is a uterine stimulant in labor, but probably has no power to initiate uterine contractions.

Quinidine and Cinchonidine correspond in action with Quinine both qualitatively and quantitatively, the latter however producing less severe head symptoms. Cinchonine also corresponds in effect, but is much the least active of the four alkaloids. It is said to produce greater headache and much precordial pain and muscular weakness, but to have little effect on sight or hearing.

Antagonists and Incompatibles.

Morphine antagonizes its cerebral action, *Atropine* its nervous, cardiac and antipyretic powers. Free *Tannic Acid* is incompatible with the Infusion of Cinchona. Iodine preparations, Alkalies, Alkaline Carbonates and Earths, are incompatible with solutions of the alkaloids, the first-named forming insoluble compounds therewith and the latter precipitating them.

THERAPEUTICS.

Cinchona is used as a tonic, and has many applications. The Infusion or Compound Tincture with a mineral acid is extremely serviceable in atonic dyspepsia, gastric catarrh of alcoholics, adynamia, convalescence, asthma, chronic bronchitis, and generally in weak subjects of flabby flesh and freely perspiring skin.

Quinine finds its principal field of action in the malarial diseases, over which its influence is specific, by reason of its power to prevent the development of the plasmodium to which malaria is due. In intermittents, a ten-grain dose of the sulphate should be given in the sweating stage and again 5 hours before the expected time of the next paroxysm. In the intervals Arsenic is better used, as quinine may cause a daily exacerbation of temperature if long continued. In remittents from 20 to 30 grains are administered once or twice daily until the temperature becomes normal, and in pernicious remittents doses of 30 to 60 grains are necessary to the safety of the patient. In chronic malarial toxemia Chinoidin is considered more effective than quinine. As a prophylactic against malarial fevers the use of small doses of quinine, 3 to 5 grains daily, has been universally approved until recently, especially in tropical countries. Professor Koch considers this to be dangerous practice and to be responsible for the increased death-rate in certain parts of West Africa during late years. He holds that the indiscriminate use of quinine as a prophylactic in malarial countries is in many cases the indirect cause of the pernicious " black-water " fever, one of the most virulent forms of malarial disease ; also that this drug seriously weakens the action of the heart when taken regularly in excessive doses, and will so inure the system to its influence that it becomes useless as a remedy when required for that purpose.

The Hypodermic Injection of Quinine is advocated by many authorities as more effectual in obstinate cases than any other method of administration. It becomes necessary in malarial fevers when vomiting is persistent and the rectum irritable, if the patient is insensible and cannot swallow, also when life is in imminent danger and the earliest possible action of the drug is important (Manson). The best salts for hypodermic use are the acid Hydrochlorate and the Hydrobromate, which are soluble in their own weight of water ; but the Sulphate may be employed, its solution being effected by adding one-half its weight of tartaric acid. Ten to fifteen grains dissolved in sterilized water would be a full hypodermic dose, which in grave cases should be given three times in 24 hours, injected deeply into the substance of the gluteal or scapular muscle. *Laveran's Formula* for this purpose is—Quinine Hydrochlorate 3, Antipyrin 2, Distilled Water 6 parts, giving a 50 per cent. solution, the injection of which is painless. This solution was used extensively during a severe epidemic of malaria in Algiers in 1894 and always proved satisfactory (Blum). In it is formed by chemical transformation a new salt, named *Chinopyrin*, which is similar but not equivalent to the quinine salt (Santesson).

Quinine is used as an antipyretic with good results, especially in septic fevers, typhus, typhoid, variola, pneumonia and acute rheumatism. Inflammations may, at their inception, be aborted by 15- or 20-grain doses, combined with Morphine, which in this respect is synergistic to quinine. Acute tonsillitis and acute catarrh may sometimes be aborted by a full dose. In surgical fevers, pyemia and exhausting suppurative conditions, also in septicemia, hectic fever, and before surgical operations, quinine is much employed. Neuralgias of malarial origin are amenable to it, as also neuralgia of the ophthalmic division of the fifth nerve. In eruptive fevers, especially scarlet fever, erysipelas and measles, it is advantageously administered throughout their course. In some skin diseases, particularly erythema nodosum, it is quite efficient, also in whooping-cough and hay-fever. In the latter affection a solution of gr. vj of the neutral hydrochlorate to the ℥ is a very useful local application. Antipyresis has of late received considerable attention, particularly in the German hospitals. The most certain and safe of all antipyretics is undoubtedly the cold bath, but it is not always the most practicable, especially in private practice. Internal antipyretics are therefore of great value, and of these the safest and best is Quinine, next in order being Lactophenin and Phenacetin.

Warburg's Tincture has obtained a very high reputation in the hands of Indian army-surgeons in the treatment of remittent and other malarial fevers of the most malignant types, in malarial neuralgiæ, acute nervous exhaustion and sudden collapse without organic disease. The most pronounced testimony to its value is that of Dr. Maclean (*Med. Times and Gazette*, Nov., 1875), whose authority will not be questioned by the most captious. He affirms that the influence of this combination to arrest an exacerbation of remittent fever is far more powerful than that of quinine alone. The remedy has become much less of a favorite since its originator was induced to make public the secret of its composition.

persistently bitter taste of quinine and its salts is best obviated by administering
form, made with glycerin as an excipient, or by using Licorice, Eriodicty
to cover the taste if given in solution or powder. The taste is extreme y
by using as a vehicle a combination of Glycyrrhizin and Fluid Extract of
named "*Velatine*," but the Quinine must be suspended therein by the and
, for when an acid is used to dissolve it the bitter taste cannot be disguis d.
dermic use the best salt is the Carbamide Hydrochlorate, by reason of its
ity and freedom from irritant quality.

CINNAMOMUM, Cinnamon,—is official under the three following titles, viz. :—

Cinnamomum Cassia, *Cassia Cinnamon,*—is the bark of the shoots of one or more undetermined species of *Cinnamomum* (nat. ord. Laurineæ), grown in China. Is a constituent of the compound tinctures of Cardamom, Catechu and Lavender. **Cinnamomum Saigonicum,** *Saigon Cinnamon,*—the bark of an undetermined species of *Cinnamomum.* **Cinnamomum Zeylanicum,** *Ceylon Cinnamon,*—the inner bark of the shoots of *Cinnamomum Zeylanicum.*

The latter occurs in light, yellowish-brown quills, consisting of several pieces rolled together, each very thin, while the Chinese variety comes in single quills of irregular form and rougher texture. The taste is warm and aromatic, and the odor very fragrant. The active principle is a *Volatile Oil,* and they also contain a resin, and tannic and cinnamic acids. Dose, gr. x–xx.

Oleum Cinnamomi, *Oil of Cinnamon, Oil of Cassia,*—a volatile oil distilled from Cassia Cinnamon. A yellowish liquid, soluble in an equal part of alcohol or of glacial acetic acid. Becomes darker and thicker by age and exposure to air. Dose, gtt. j–v.

Aqua Cinnamomi, *Cinnamon Water,*—has of the Oil 2, triturated with Precipitated Calcium Phosphate 4, and Distilled Water to 1000. Dose, indefinite.

Spiritus Cinnamomi, *Spirit of Cinnamon,*—has 10 per cent. of the oil in Alcohol to 100. Dose, ♏v–xxx.

Tinctura Cinnamomi, *Tincture of Cinnamon,*—has of Ceylon Cinnamon 10, Glycerin 5, Alcohol and Water to 100. Dose, ʒss–ij.

Pulvis Aromaticus, *Aromatic Powder,*—has of Ceylon Cinnamon 35, Ginger 35, Cardamom 15, Nutmeg 15, triturated together to a fine powder. Dose, gr. x–xxx.

Extractum Aromaticum Fluidum, *Aromatic Fluid Extract,*—has of Aromatic Powder 100 per cent. in Alcohol. Dose, ♏x–xxx.

Cinnamon is an agreeable carminative, somewhat astringent and stimulant, also highly aromatic and antiseptic. The Oil is not astringent but is a stimulant to the nervous and vascular systems, and is by some believed to exercise a specific action on the uterus, particularly as a hemostatic. In overdoses it acts as an irritant and narcotic poison.

The various preparations are in general use as flavoring excipients, and the Aqua is a pleasant vehicle for extemporaneous mixtures. The Bark and its preparations are used to check diarrhea in combination with opium, chalk, or some vegetable infusion.

Cinnamon was formerly used with success in uterine hemorrhage, generally in combination with sulphuric acid, which is itself an efficient uterine hemostatic. The Oil is a good remedy for flatulence, paralysis of the tongue, cramp of the stomach, enteralgia and similar complaints, and is sometimes used to check nausea and vomiting. It has an ancient reputation for healing properties, and its antiseptic powers have long been known, especially on the mucous membranes, being utilized as an injection in gonorrhea. It has lately been employed in France as an internal germicide, with great satisfaction; and has given particularly good results in the treatment of typhoid fever, against the bacillus of which disease it is believed, by its advocates, to have specific and destructive powers.

COCA, Coca, *Cuca,*—the leaves of *Erythroxylon Coca,* a small shrub of the nat. ord. Lineæ, indigenous to the mountains of Peru and Bolivia, and cultivated in those and other S. American states, also in India and Java. Its odor is tea-like, its taste slightly bitter and aromatic. It contains a crystalline alkaloid, *Cocaine,* $C_{17}H_{21}NO_4$, which when heated with HCl is split up into methylic alcohol, benzoic acid and another alkaloid named *Ecgonine.* In the Java leaves is found an alkaloid *Tropacocaine,* which is also a compound of benzoic acid and a base. Other constituents are the alkaloids *Cocamine, Isococamine, Homococamine* and *Homoisococamine,* together with an aromatic oil and coca-tannic acid. The leaves grown in Peru and Bolivia contain more cocaine than the others and very small quantities of the other alkaloids; those from India and

Java contain less cocain but a greater amount of the other alkaloids. Coca should not be confounded with Cocoa, the seed of the chocolate-tree, *Theobroma Cacao*. Dose of the leaves, ʒj–iv.

Preparations.

Extractum Cocæ Fluidum, *Fluid Extract of Coca*,—Dose, ʒ ss–ij. Leaves of good quality are often so difficult to obtain that Dr. Squibb, the well-known pharmaceutist, more than once omitted the fluid extract from his trade list, with the explanation that "it is impossible to get Coca of proper quality for medical use."

Cocaina, *Cocaine*, $C_{17}H_{21}NO_4$ (Unofficial),—crystalline, colorless and of bitter taste, soluble in 1300 of water, in 10 of alcohol, in 12 of olive oil, in 4 of oleic acid, in 4 of ether and in ½ of chloroform. It has decided basic properties, combining with acids to form salts. It exists in the leaves in very small quantity,—from 0.02 to 0.04 per cent. Dose, gr. ⅛–j.

Cocainæ Hydrochloras, *Cocaine Hydrochlorate*, $C_{17}H_{21}NO_4HCl$, also called Cocaine Muriate, but is more properly Cocaine Chloride,—occurs in colorless crystals, odorless, of saline, slightly bitter taste, producing on the tongue a tingling sensation followed by numbness. Soluble in 0.48 of water, and in 3½ of alcohol. Is used in aqueous solutions of 2 to 10 or more per cent. hypodermically, or locally to mucous surfaces as a local anesthetic. Dose, internally, gr. ⅛–j; by hypodermic injection, gr. ⅛–½.

Cocainæ Oleas, *Oleate of Cocaine* (Unofficial),—a 10 per cent. solution of the alkaloid in Oleic Acid, for external use.

Wines, Lozenges, Elixirs, Glyceroles, Pastes, etc., of Coca are being manufactured and marketed in great variety. The Citrate and Salicylate of Cocaine are products of the laboratory and may be obtained in the shops.

Celerina, (Unofficial),—a proprietary preparation said to contain in each fluid-drachm gr. v each of Coca, Celery, Kola and Viburnum, with aromatics. Dose, ʒj–ij.

Tropacocaine, *Tropain*, *Benzoyl-pseudotropeine* (Unofficial),—was first obtained from the Java coca leaves and was afterwards made synthetically. It is much less toxic than Cocaine. The Hydrochloride is used to produce anesthesia of the eye. It produces local anesthesia more rapidly than Cocaine, but for a shorter time, and causes less dilatation of the pupil. Dose, gr. ⅛–j.

PHYSIOLOGICAL ACTION.

Coca is an aromatic bitter tonic, a diuretic and a cerebral and nervous stimulant. Small doses improve digestion, stimulate respiration, increase the heart's action after a brief depression, raise the arterial tension, and increase the excitability of the sensory nerves. It stimulates the brain by increasing its blood-supply, producing wakefulness, a sense of well-being, and a marked diminution of the senses of fatigue, hunger and thirst. Under its daily use a considerable amount of labor and loss of sleep can be borne without suffering. Though diuretic, it lessens the quantity of urea eliminated by checking the processes of waste. Large doses produce impaired coördination, hallucinations and delirium.

Cocaine acts upon the lower animals similarly to Caffeine. It tetanizes frogs, and in large doses paralyzes their sensory nerves and the posterior columns of the spinal cord. It kills rabbits and dogs by paralysis of the respiratory centre. In proper doses it raises arterial tension by stimulating the vaso-motor centres and the cardiac motor system. An effect of cocaine, observed in mice, is a wide-spread destruction of the hepatic cells, which become vacuolated and frequently necrosed, and the liver is much enlarged and pale from fatty infiltration.

On man, in small doses Cocaine is a cerebral, cardiac, respiratory and nervous stimulant and a prompt diuretic. It improves digestion, stimulates respiration, increases the heart's action, raises the arterial tension and exalts the irritability of the sensory nerves. It stimulates the brain by increasing its blood-supply, producing wakefulness and marked diminution of the senses of fatigue and hunger. Though decidedly diuretic, it lessens the quantity of urea by checking the processes of waste, thus acting as an indirect nutrient, and enabling the body to maintain its energy on a lessened supply of food. It first decreases and then increases the cutaneous circulation, flushing the surface, exciting perspiration and a sense of heat, and does actually raise the body-temperature. It dilates the pupil, both when locally applied and when taken systematically, and stimulates intestinal peristalsis as well as the evacuation of the bladder in a few minutes after its ingestion.

An overdose produces symptoms of cardiac and respiratory embarrassment in a very short time. The pulse, at first quick and forcible, becomes small, rapid and intermitting, the heart apparently standing still in systole once in every 10 or 12 beats. Respiration is slow and shallow, and a sense of tightness about the chest is often very marked; the skin grows cold and clammy, and the subject is seized with a sense of impending dissolution. Death occurs in animals by paralysis of the respiration, but in man a tetanoid spasm of the cardiac muscle seems to occur, which is equally dangerous to life. Maurel has shown that, as the capillaries contract powerfully under the influence of cocaine, thromboses and embolisms, particularly pulmonary embolisms, capable of causing fatal accidents, may be produced thereby. It profoundly affects the leucocytes, which become spherical and rigid, increase in size, and no longer adhere to the walls of the vessels. Other symptoms are impairment of coördination, hallucinations and delirium. Lethal doses paralyze the intracardiac motor ganglia, the posterior columns of the cord, the sensory nerves, and the respiratory centre.

Several years ago, Satterwhite, as a result of the study of one hundred cases of poisoning by this alkaloid, called attention to the dangers attending the use of even very small doses, and at about the same time another author, after summarizing the records of fifty cases, made a similar announcement. A case is reported by Broughton in which unconsciousness, an irregular, slow respiration, and a slow pulse, followed the application of three minims of a twenty per cent. solution within the cavity of a tooth. Whistler, after the application of a four per cent. solution to the nasal cavity, noted vertigo and threatening syncope. In a case of glossitis, Ricket states that the patient became moribund after the use of a similar solution. Myrtyle dropped three minims of a three per cent. solution into each eye, which immediately caused a sense of numbness in the back of the tongue and throat, palpitation, threatened syncope and nausea. Bettleheim records that in one case the hypodermic injection of one-sixth of a grain induced alarming symptoms; and in another, one-eighth of a grain similarly injected caused unconsciousness, congestion of the face, irregular breathing and trismus. Baker mentions a case in which one grain injected into the gums by a dentist produced death in a few minutes, and Hænel records the case of a man in whom the injection of 1⅓ grains was followed by a fatal result.

As a *Local Anesthetic* the power of Cocaine is very great over a limited area. Applied to such structures as the Schneiderian membrane, and the mucous covering of the glans penis, or injected hypodermically in other locations, it blanches the structures and causes a profound but temporary anesthesia throughout a small space. Applied to the tongue it temporarily destroys both taste and tactile sensibility;—to the ocular conjunctiva, it produces profound anesthesia of that membrane, together with dilatation of the pupil, partial paralysis of accommodation, enlargement of the palpebral fissure, slight lachrymation, and sometimes temporary ptosis. This profound degree of anesthesia is thought by some to be caused by its paralyzing the terminal twigs of the sensory nerves,—by others to be due to vaso-motor stimulation rendering the nerves bloodless and therefore unable to transmit sensory impressions. It produces mydriasis by stimulation of the ends of the sympathetic in the iris, and does not affect the third nerve or the sympathetic centre.

In general action, Cocaine resembles Atropine very closely, especially in its influence upon the pulse and blood-pressure, the respiration, pupils, salivary glands, sweat-glands and intestinal peristalsis. In its symptoms, both from large and small doses it exactly parallels Sparteine, another cardio-inhibitory depressant.

Antagonists.

Ammonia and *Amyl Nitrite* combat the earliest symptoms of cardiac depression,—then *Alcohol* and *Opium* as stimulants to the heart, also *Artificial Respiration*. The most direct antagonist is *Chloral*, so also are Chloroform and Ether. *Morphine* is also directly antagonistic at almost all points of its action.

The Cocaine-Habit.

Cocainism, the Cocaine-habit, is now presenting itself to observation, numerous instances of persons addicted to its excessive use being met with. Loss of digestive power, absolute insomnia, enfeeblement of the intellect, great emaciation, ascites, general marasmus, nausea, decay of the teeth, an excessively fetid breath, amblyopia, visual hallucinations and complete anorexia, form a consensus of symptoms which rival the worst effects of the opium habit. Peculiar hallucinations are characteristic of the action of cocaine. One patient was always scraping his tongue to extract from it little black worms; another made his skin raw in the endeavor to draw out cholera microbes; a third was constantly looking for crystals in his skin. Two of these subjects suffered from epileptic attacks and the third from cramps. (Magnan and Saury.) Some observers report the most extraordinary mental changes resulting from cocainism, exceeding those produced by any other drug. Intense selfishness, utter disregard of all social and domestic duties, the most debasing habits, complete destruction of all noble qualities, and a general condition of depravity, are some of the results which are charged to this drug. The author's experience with a large number of such cases convinces him that a cocaine habitué who has used the drug daily for a month is practically an insane individual while under the influence of the drug; but that the mind soon resumes its normal condition after withdrawal thereof, which can be done, in nearly all cases, at once, without involving any great suffering.

Many of the proprietary catarrh-snuffs contain cocaine, and their use may cause the cocaine-habit, which, however, is in most cases acquired by morphine habitués who go to cocaine in the expectation of finding help in their struggle against the tryanny of the former drug. In this hope, however, they are always disappointed when the drugs are in their own hands. The victim soon finds that one of these agents antagonizes the other to a great extent, while, at the same time, it sets up peculiar troubles of its own; and that there is a constant need of more morphine to counteract the cocaine-symptoms, and of more cocaine to antagonize the symptoms due to the increased amount of morphine. The result will be that one who is using only a moderate daily amount of morphine, will, if cocaine be added, soon be using a very great amount of morphine, as well as of cocaine, and "the last state of that man is worse than the first."

As the stimulant effect of a single hypodermic injection passes off very quickly, within about 15 or 20 minutes, the cocaine habitué is under the necessity of constantly injecting the drug, so that, as one such expressed it, "I had no time to go home,—no time to do anything except to prepare and take one 'shot' after another." The effect of such repeated puncturing of the skin is very disastrous to that tissue, causing great induration and numerous sloughing sores.

THERAPEUTICS.

Coca-leaves are chewed by the Peruvians for the purpose of sustaining them during arduous labors and long journeys, and are so highly esteemed as to be represented on their national coat-of-arms, the people using them much as we do tea, coffee or tobacco. This example was imitated by Weston, the pedestrian, who is said to have been detected chewing the coca-leaf during one of his protracted walks. Cocaine is a useful stimulant to the brain and the nervous system in many morbid conditions, particularly cerebral and spinal anemia, neurasthenia, melancholia, hysterical and hypochondriacal insanity, and in protracted mental depression with suicidal tendency. It may be employed with benefit in wasting diseases to retard waste and to stimulate digestion, in convalescence from fevers and other acute maladies, and in migraine and neuralgia due to depression of the nervous system. It is very beneficial in some cases of the vomiting of pregnancy, in stomatitis and gastralgia, and in functional impotence due to general atony of the spleen.

A wine of the leaves is thought by singers and speakers to relieve hoarseness, to make tense the vocal cords and to improve the timbre of the voice. Coca-leaves may be smoked in cigars or cigarettes to obtain the exhilarating effects of the drug, and for the relief of asthma, hay-fever and many irritable throat affections. The Oleate of Cocaine is an efficient palliative application to painful hemorrhoids, fissures of the anus, burns, boils, and irritable ulcers; also in pruritus pudendi et ani and skin diseases attended with intolerable itching.

Cocaine Hydrochlorate has achieved celebrity as a local anesthetic, and is of great value in many operations on the eye and ear, nasal passages, uterus and urethra. A 2 to 4 per cent. solution is brushed lightly over the mucous surface or injected into the urethral canal, the application being repeated within 5 or 10 minutes if profound local anesthesia is required. After about fifteen minutes any superficial operation may be performed without giving the slightest pain. It is used in the same manner with decided benefit in congestion of the nasal passages from acute catarrh and hay-fever; and is applied to the cervix uteri to relieve the first pains of labor, to the ear for tinnitus aurium, and by inhalation to strengthen the vocal cords, to relieve hoarseness and cough, and to improve the quality of the voice. It may be injected into the bladder before lithotrity, into the urethra before the passage of sounds or catheters or to relieve chordee, and it is an excellent application to the gums of teething infants. To be efficient it must reach the terminal filaments of the sensory nerves in sufficient concentration. Rhus poisoning, by either the oak or ivy, is promptly controlled by the application of a 5 per cent. solution or oleate, freely over the affected surface. It gives instant relief from the burning and itching, and speedily reduces the dermatitis. It is injected hypodermically around the prepuce to prevent pain during circumcision, into the vicinity of the supra-orbital and infra-orbital foramina to cut short neuralgia of those nerves, into hemorrhoids previous to their ligation, and into the skin and the subcutaneous tissues to produce local anesthesia in many minor operations.

The Infiltration Method of Schleich is the injection in quantity (up to 100 c.c.) of very dilute solutions (1 in 10,000, 1 in 1,000 and 1 in 500), at first superficially into the epidermis and then deeper, by long, fine needles, so as to produce a local edema over the field of operation [see page 614]. *The Intraneural Method* is the injection of a 2 per cent. solution into the nerve-trunk supplying the region to be anesthetized, but this has produced neuritis. *The Paraneural Method* is the injection of the same solution in the immediate vicinity of the nerve-trunk. *The Subarachnoid Method* of Corning, Bier, etc., is the injection of 10 to 15 minims of a fresh, sterilized, 2 per cent. solution (gr. ⅕ to ⅓ of cocaine) into the spinal canal, by a long needle inserted between the 3rd and 4th or between the 2nd and 3rd lumbar vertebræ into the subarachnoid space. This produces complete anesthesia below the diaphragm, beginning within 5 to 10 minutes and lasting about an hour, but has no effect on consciousness. Under it many major operations have been performed painlessly on the pelvic region and the lower extremities. The method is not free from danger, having a mortality of about one per cent. After-effects in many cases include dizziness, headache, nausea and vomiting.

The rapid accumulation of cases in which alarming symptoms followed the injection or the local application of small quantities of cocaine, together with the fact that these untoward effects are due to individual idiosyncrasy and do not invariably occur immediately, is a positive warning to the profession that this powerful substance should not be used in any case for the first time without the proper antidotes at hand and the patient being kept under surveillance for at least a half hour.

As a mydriatic for ophthalmological use, Cocaine has peculiar qualities which make it one of the most serviceable of the class. The dilatation produced by it is great, is quickly attained, lasts only 12 to 20 hours, is promptly overcome by physostigmine, and is not accompanied by much photophobia, due to the fact that the cocainized pupil is not rigidly dilated (as with atropine), but reacts to light. The accommodation, moreover, is greatly reduced, but not entirely paralyzed, and is quickly regained.

As an antagonist Cocaine is of especial value in narcotic poisoning by chloral or opiates, where depression of the cardiac and respiratory centres exists. It is also indicated in chronic depressant poisoning from the bromides, and in spinal paralyses. In these cases it has all the advantages of strychnine without its poisonous character. It has no value in the proper treatment of morphinism except to antagonize certain heart symptoms, for which purpose it should be administered only by the physician in charge of the case; but never as a regular remedy, at regular intervals of time, even by him.

Unofficial Substitutes for Cocaine.

Eucaine-A, $C_{19}H_{27}NO_4$,—is an artificial alkaloid, which is much less toxic than Cocaine and almost as efficient as a local anesthetic, but causes irritation and some pain. The Hydrochloride is soluble in 10 of water and in 3 of alcohol.

Eucaine-B, $C_{15}H_{21}NO_2$,—is preferred to Eucaine-A for ophthalmic work, being less irritant. Solutions of the Hydrochloride of 1 to 2 per cent. are used in the eye, of 2 to 5 per cent. for other mucous surfaces and for hypodermic injection. This salt is soluble in 20 of water and in 14 of alcohol, and its solutions may be sterilized by boiling without undergoing decomposition. The Eucaine preparations are proprietary, being manufactured by patented processes.

Orthoform, a patented product, is the methylester of amido-oxybenzoic acid, and has no chemical relation to cocaine, which it resembles only in its action on the sensory nerve terminations. It occurs as a white, crystalline, odorless and tasteless powder, almost insoluble in water. It is non-toxic, somewhat antiseptic, and has little or no effect upon the sensibility of the unbroken skin or upon healthy mucous membranes, while its insolubility precludes its use by hypodermic injection. It is efficient as a local anesthetic only when it is in actual contact with exposed nerve endings, and is chiefly used as a dusting powder or ointment for painful surfaces, such as abrasions, ulcers or burns. In doses of gr. viij–xv it has been given internally for the relief of pain in ulcer and cancer of the stomach. A saturated solution in collodion may be used as a paint, and an emulsion in glycerin is employed during operations within the uterus. The Hydrochloride is more soluble in water and may be used for internal administration or urethral injection, but is too acid for hypodermic injection or eye application.

Nirvanin, a patented coal-tar derivative of the orthoform type, is very soluble in water, can be sterilized, and is antiseptic as well as anesthetic, non-irritant and only one-tenth as toxic as cocaine. It is used for local anesthesia in 2 to 5 per cent. solutions.

Holocaine,—is a patented synthetic product prepared by the interaction of Phenacetin and Paraphenetidin. The Hydrochloride is soluble in 50 of water and in 6 of alcohol. It is highly toxic and cannot be used hypodermically, but is employed by ophthalmologists in a 1 per cent. solution. It produces complete and rapid anesthesia and neither dilates the pupil nor affects the blood-vessels.

COCCUS, Cochineal,—is the dried female of *Coccus cacti*, an insect of the order Hemiptera, which feeds on the cactus plants of Mexico and Central America. It is of ovate, plano-convex form, of a purple-gray or purple-black color, yielding when crushed a dark-red powder, which contains *Carminic Acid*, or *Carmine*, the red coloring-matter, which is soluble in water and alcohol, but not in oils. Cochineal is an ingredient of Tinctura Cardamomi Composita, and is used in pharmacy solely as a coloring material.

The only therapeutic use of Cochineal is in whooping-cough and neuralgia, in which affections it is supposed to have considerable influence, especially in the former. Its dose for an infant is about gr. 1/3 thrice daily.

COLCHICUM, Meadow Saffron,—is the corm and seed of the *Colchicum autumnale*, a European plant of the nat. ord. Liliaceæ. It contains an intensely bitter, poisonous alkaloid, *Colchicine*, $C_{17}H_{19}NO_5$, which by the action of acetic and mineral acids is converted into *Colchi-*

ceïne and a resin; also tannic and gallic acids, resin, starch, sugar, etc. It is official in two forms, namely—

Colchici Radix, *Colchicum Root*,—the corm, about an inch long, white internally, grooved on one side, inodorous, taste sweetish, bitter and acrid. Is less active than the seed. Dose, gr. ij–viij. It contains of Colchicine, 0.45 part per 1000.

Colchici Semen, *Colchicum Seed*,—about $\frac{1}{12}$ inch thick, sub-globular, resembling black mustard seed but larger, very hard and tough, inodorous, of bitter and acrid taste. Dose, gr. j–v. It contains of Colchicine, 3.35 parts per 1000.

Preparations.

Extractum Colchici Radicis, *Extract of Colchicum Root*,—made with Acetic Acid 35 parts to 100 of the root, and sufficient water. Dose, gr. ½–ij.

Extractum Colchici Radicis Fluidum, *Fl. Extract of C. Root*. Dose, ♏ij–x.

Extractum Colchici Seminis Fluidum, *Fl. Extract of C. Seed*. Dose, ♏j–v.

Vinum Colchici Radicis, *Wine of Colchicum Root*, 40 per cent. Dose, ♏v–xv.

Vinum Colchici Seminis, *Wine of Colchicum Seed*, 15 per cent. Dose, ♏x–xxx.

Tinctura Colchici Seminis, *Tincture of C. Seed*, 15 per cent. Dose, ♏x–xxx.

Colchicina, *Colchicine*, $C_{17}H_{19}NO_5$ (Unofficial),—a white or yellowish, amorphous powder, of saffron-like odor and bitter taste, soluble in water and in alcohol. Dose, gr. $\frac{1}{120}$–$\frac{1}{60}$. Is suitable for hypodermic injection.

Laborde and Houdé condemn all preparations made with acetic acid, also those made from the tubers and all wines. The best preparation is Colchicine, in granules or in a wine; or a strong tincture made from fresh seed with the shell on, the latter containing a very volatile but active oil. Of this seed ℥j to ½ pint of highest proof alcohol, standing for 2 weeks. Of this ʒv to water q. s. ad O½, of which the dose is ℥ss every 4 hours night and day, avoiding acids, until nausea, vomiting and purging set in.

Colchicine Salicylate (Unofficial),—is marketed in capsules, each capsule containing Colchicine, gr. $\frac{1}{240}$ and natural Methyl Salicylate (Oil of Wintergreen), gr. iij. Dose, 1 capsule every 2 hours, up to 10 or 15 daily.

PHYSIOLOGICAL ACTION.

Colchicum is emetic, diuretic and diaphoretic, a drastic purgative, a gastro-intestinal irritant and a cardiac depressant. In small doses it increases secretion, especially the urine and the sweat. In full doses its action is emeto-cathartic, producing profuse watery discharges, great nausea and extreme muscular feebleness. In large doses it is a powerful irritant of the gastro-intestinal tract, causing severe griping, choleraic discharges, lowered arterial tension and depression of the heart by reflex action over the distribution of the pneumogastric,—then great prostration, convulsions and collapse, death occurring from exhaustion, with consciousness preserved until carbonic acid narcosis sets in. The extent of its influence on the excretion of uric acid and urea is very much disputed, but it probably increases the flow of bile, and certainly unloads the portal circulation.

Antagonists and Incompatibles.

Tannic Acid to retard absorption. Emetics and cathartics, also warm demulcent drinks freely. *Morphine* hypodermically to antagonize the cardiac depression, also Alcohol.

THERAPEUTICS.

Colchicum is a specific palliative in gout of acute form, in which it should be given with an alkali, and kept short of emeto-catharsis. It does not prevent relapses, and its power in this disorder is weakened by repetition. In ascites from obstructive disease of the liver it is most effective, given in full doses to establish a profuse drain, with opium to sustain the heart. In acute cerebral congestion and in portal congestions it is well given as a drastic purgative. It is often used with marked success in acute rheumatism, but frequently fails, and in no case should it be continued long in this affection. It has been used with good results in the treatment of gonorrhea and chordee. The alkaloid is probably the best preparation for general use, and is admittedly superior to the other preparations in acute gout. The preparation known as Colchicine Salicylate is a solution of colchicine in oil of wintergreen. It should prove to be a reliable remedy for gout and rheumatism, and also for many disorders in which the rheumatic diathesis is a factor.

COLOCYNTHIS, Colocynth,—is the fruit of *Citrullus Colocynthis*, deprived of its rind. The plant is a native of Spain and Asiatic Turkey and belongs to the nat. ord. Cucurbitaceæ, the fruit being of the size of a small orange, white, light, spongy, inodorous, very bitter, containing many flat, brown seeds which should be rejected before the pulp is used. Its active principle is *Colocynthin*, $C_{56}H_{84}O_{23}$, an amorphous but crystallizable bitter glucoside, readily soluble in water. It also contains *Colocynthein*, a resin, and *Colocynthitin*, a tasteless, crystalline powder, soluble in ether but not in water, and devoid of purgative action.

Preparations.

Extractum Colocynthidis, *Extract of Colocynth.*—Dose, gr. ½–ij.

Extractum Colocynthidis Compositum, *Compound Extract of Colocynth,*—contains of the preceding 16 parts, Aloes 50, Cardamom 6, Resin of Scammony 14, Soap 14, Alcohol 10. Dose, gr. v–xx.

Pilulæ Catharticæ Compositæ, *Compound Cathartic Pills,*—have of the preceding 8, Calomel 6, Extract of Jalap 3, Gamboge 1½, Water to make 100 pills. Dose, j–iij.

Pilulæ Catharticæ Vegetabiles, *Vegetable Cathartic Pills,* have of Compound Extract of Colocynth 6, Extract of Hyoscyamus 3, Extract of Jalap 3, Extract of Leptandra 1½, Resin of Podophyllum 1½, Oil of Peppermint 0.8, Water to make 100 pills. Dose, j–iij pills.

Laville's Anti-Gout Remedy,—is a proprietary medicine prepared in France and purporting to be "a mixture of prepared Kino-colocynthine." The published formula is as follows: Active principle of Colocynth 2½, Quinine and Cinchonine 5, Spanish Wine 800, Alcohol 100, Water to 1000 parts; but there is good reason for believing that it contains *Colchicine* instead of Colocynthin.

Colocynth is classed among the tonic-astringent and resin-bearing purgatives. In moderate doses it increases peristalsis and the intestinal glandular secretions, producing bilious, watery evacuations with much colicky, griping pain. Its purgative action is specific, and may be obtained by its application to the skin over the abdomen. In large doses it is a violent irritant of the gastro-intestinal tract, and has frequently produced fatal gastro-enteritis. It is popularly supposed to be abortifacient, but this is true only of quantities sufficient to endanger life. It is an indirect diuretic.

Colocynth is too severe an agent to be administered alone for constipation, but it makes a useful factor in compound purgatives, as the compound cathartic pills. In cerebral congestion it may be used to produce rapid derivation, and in ascites to set up a profuse drain from the intestinal canal. In certain cases of chlorotic amenorrhea it stimulates the pelvic nerves and vessels with excellent results. There seems to be abundant evidence that in very small doses (♏ $\frac{1}{20}$—$\frac{1}{16}$ of a tincture) Colocynth is an efficient remedy in colic, sciatica, ovarian and other neuralgiæ, as well as in the pain of glaucoma. These actions may be due to its two non-purgative principles, which may prove to possess powers not heretofore suspected, an example of which is seen in the cardiac influence of Convallaria, a drug which was formerly known only as a purgative and a diuretic.

CONIUM, Hemlock,—is the full-grown fruit, gathered while green, of *Conium maculatum*, the spotted hemlock, nat. ord. Umbelliferæ. It contains 3 alkaloids, namely,—*Coniïne*, $C_8H_{15}N$, liquid and volatile, *Methyl-coniïne*, $C_8H_{14}NCH_3$, and *Conhydrine*, $C_8H_{17}NO$, solid and volatilizable; also Coniïc Acid and a volatile oil. *Paraconiïne* is an artificial substance produced by the reaction between Butyric Aldehyde and an alcoholic solution of Ammonia, and is isomeric with Coniïne but not identical with it. The leaves of Conium are no longer official.

Preparations.

Extractum Conii, *Extract of Conium*,—each grain represents a grain of the crude drug. Dose, gr. ij–v up to gr. xl.

Extractum Conii Fluidum, *Fluid Extract of Conium*,—has the same strength as the extract. Dose, ♏ij–v up to ♏xl.

Coniïna, Coniïne, $C_8H_{15}N$ (Unofficial),—an oily, limpid, volatile liquid, of acrid taste, alkaline reaction, and an odor comparable to that of the urine of mice. It is quickly decomposed by heat, and if exposed to the air soon becomes inert. Dose, gr. $\frac{1}{60}$–$\frac{1}{16}$, or in minim doses, ♏$\frac{1}{10}$–ij. Is too irritant for hypodermic use, unless carefully neutralized by acetic acid. The Hydrobromate in watery solution of gr. viij to the ℥, of this ♏x = gr. ⅙, is a good form for subcutaneous or stomachal administration, and may be given in doses of gr. $\frac{1}{12}$ to gr. j, as it is not actively toxic.

All the preparations of Conium are uncertain in action, particularly the extract, as the active principle is very volatile. Any specimen must be carefully tested before deciding on its dosage, and if the powerful mouse-like odor of the drug be absent, the preparation is probably worthless.

PHYSIOLOGICAL ACTION.

The special Action of Conium and Coniïne is the production of motor paralysis without loss of consciousness or sensation. It paralyzes the motor nerves, the action commencing at the peripheral end-organs and extending upwards, involving the nerve-trunks and finally the centres, but the muscular irritability remains unaffected. Methyl-Coniïne, on the contrary, stimulates the spinal cord, and produces the convulsions often seen in Conium poisoning. The sensory nerves are not affected, but the general sensibility is impaired, a feeling of numbness being experienced in the extremities.

Gastric irritation is usually the first sensation produced by a full dose of Conium, nausea and vomiting being its symptoms. Then occur weakness of the legs, numbness and fatigue, drooping eyelids, diplopia, slightly dilated pupils, vertigo, impaired utterance, slow and labored breathing, and if the dose be lethal, paralysis of the voluntary muscles occurs, those of the lower limbs being first affected; speech and vision are lost, and finally death occurs from paralysis of the muscles of respiration. The heart is not affected and the mind remains clear but torpid and indifferent, until carbonic acid narcosis sets in. Muscular movement counteracts the effects of the drug to a very great extent.

Conium is believed to have been the state poison of the Athenians, by the juice of which Socrates and Phocion died. It is closely allied in its physiological action to Curare.

Antagonists and Incompatibles.

Nux Vomica and its alkaloids, *Picrotoxin* and other tetanizers are antagonistic. Tannic acid and caustic alkalies are chemically incompatible.

THERAPEUTICS.

Conium is especially indicated in diseases characterized by excessive motor activity. Large doses are required, as some physiological action is necessary. Children bear it well, their constant activity preventing its full action. In chorea and paralysis agitans it palliates, by depressing the motor nervous system. In acute mania and delirium tremens, to quiet motor excitement and prevent exhaustion, it is remarkably efficient, especially when given conjointly with morphine. When pain and spasm are present, it will prove a useful agent; and in tetanus, blepharospasm, asthma, whooping-cough, and other spasmodic affections it is frequently used with very great benefit. The pain of cancer seems to be especially amenable to its influence when locally applied, and Coniïne vapor is an admirable palliative of the tickling cough of phthisis and the irritability of the air-passages in acute bronchitis. In pneumonia and pleurisy the hypodermic use of Coniïne to afford the organs rest by inducing a paretic state of the respiratory muscles has been followed by a marked decrease in the temperature and pulse-rate.

CONVALLARIA,—is the rhizome and roots of *Convallaria majalis*, Lily of the Valley, a stemless perennial of the nat. ord. Liliaceæ, indigenous to Europe, Northern Asia and the Southeastern portion of the United States. The preparations in the market vary in action, according to the quantity of the resin present, it being emeto-cathartic. Convallaria contains two glucosides, namely—*Convallamarin*, on which the cardiac action depends, and *Convallarin*, a crystalline, purgative principle, insoluble in water; also an acrid *Resin* which probably contains the latter glucoside.

Preparations.

Extractum Convallariæ Fluidum, *Fluid Extract of Convallaria*,—is the only official preparation, and probably contains Convallarin, which is not present in aqueous preparations, being insoluble in water. Dose, ♏ij–x.

Extractum Convallariæ (Unofficial),—from the flowers and stalks with ⅓ of the leaves and root; is freely soluble in water and in alcohol. Dose, gr. ij–x.

Infusum Convallariæ (Unofficial),—prepared from the flowers, leaves and stems 25 parts, in water 75. Dose, ℥ss–ij.

Convallamarinum, *Convallamarin*, $C_{23}H_{44}O_{12}$ (Unofficial),—an amorphous, white, bitter powder, freely soluble in water and in alcohol. Dose, gr. ¼–ij.

PHYSIOLOGICAL ACTION.

Convallaria has long been known as a decided cathartic and a prompt and powerful diuretic, but its cardiac action has excited great attention, and it is now considered a close analogue of Digitalis, while free from the so-called cumulative action which makes the latter drug so frequently a dangerous remedy. Preparations of the root have a powerful emeto-cathartic action, probably due to a preponderance of the resin. Those freed from this ingredient correspond in action to Convallamarin, stimulate the appetite without impairing digestion, increase peristalsis without producing catharsis, slow the heart and raise the arterial tension, also slowing and deepening respiration. Lethal doses at first produce irregularity of the cardiac action and spasm of the respiratory muscles, high arterial tension and a very rapid pulse,—followed by lowered blood-pressure, very slow and deep breathing, and finally arrest of the heart in systole. Its mode of action is by direct stimulation of the pneumogastric, the motor and sensory nerves retain their irritability, the muscles preserve their contractility, and the cerebral functions and the pupil are unaffected.

Convallarin is a drastic purgative in 3-grain doses. Convallamarin is an emetic even in small quantity, and the powdered root is sternutatory.

THERAPEUTICS.

Convallaria is a heart-tonic like Digitalis, and is indicated in the same class of cases as is that drug, with the advantage that having no cumulative action it is not dangerous to the heart in medicinal doses, and does not disturb the stomach or the functions of the cerebro-spinal axis. In doses of gr. xv–xxv of the extract it slows the action of the heart and increases the force of its contractions, raises arterial tension, augments the force and volume of the respiration, and produces prompt diuresis without altering the composition of the urine. It is often a valuable remedy in mitral stenosis or insufficiency with venous stasis, dilatation of the heart, palpitation, vehement cardiac action or disordered rhythm, and in all valvular affections accompanied by dropsy and a weak heart. It has also been used with benefit in pneumonia, typhoid fever and renal dropsy. Its action is maintained for several days after its administration has been suspended.

COPAIBA, Copaiba, *Balsam of Copaiba*,—is the oleoresin of *Copaifera Langsdorffii*, and other species of *Copaifera*, a S. American tree of the nat. ord. Leguminosæ, growing chiefly in the valley of the Amazon. It is a translucent, viscid liquid, of yellow color, aromatic odor, acrid and bitter taste, not fluorescent, soluble in alcohol and in benzol. It is not a balsam as it contains no cinnamic acid. Its constituents are a *Volatile Oil* and a *Resin* in about equal proportions, the latter containing nearly 99 per cent. of *Copaibic Acid*. Dose, ♏x–ʒj.

Preparations.

Oleum Copaibæ, *Oil of Copaiba*, $C_{10}H_{16}$,—a pale yellow liquid, of sp. gr. 0.890, bitter taste and neutral reaction, soluble in 10 volumes of alcohol. Dose, ♏x–xv.

Resina Copaibæ, *Resin of Copaiba*,—is the residue left after distilling off the volatile oil from Copaiba; a yellowish, brittle body, of acid reaction, soluble in alcohol, benzol or amylic alcohol. Consists mainly of Copaibic Acid, which is crystallizable, also 1½ per cent. of a viscid resin. Dose, gr. j–v.

Massa Copaibæ, *Mass of Copaiba*,—consists of Copaiba 94, fresh Magnesia 6, triturated with water and set aside to concrete into a pilular mass. Dose, ♏x–ʒj.

Mistura Copaibæ Composita, *Compound Copaiba Mixture*, *Lafayette Mixture* (Unofficial).—℞. Copaibæ ℥j, Spiritus Ætheris Nitrosi ℥j, Liq. Potassæ ʒij. Mix with constant stirring, then add: Tinct. Lavandulæ Co. ℥j, Syrupi ℥ijss, Mucil. Dextrini (N. F.) q. s. *ad* ℥viij. Mix the whole thoroughly by shaking. Of this each ʒ contains ♏vijss of Copaiba (*National Formulary*). Dose, ʒj–iv.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Copaiba is a stimulant diuretic, diaphoretic, expectorant, and a gastro-intestinal irritant. Its taste is bitter and nauseous. In the stomach it causes heat, eructations, heaviness, frequently anorexia and diarrhea, and if continued for any length of time gastro-intestinal catarrh and desquamative nephritis may result. The oil and resin diffuse into the blood and are excreted by the bronchial mucous membrane, skin and kidneys, producing increased secretion at the points of elimination. The various secretions have the odor of the drug, especially the urine. In medium doses it increases the quantity of urine and its solid constituents, but large doses will cause scanty urine, containing albumin, casts and blood, with pain in the loins and other signs of renal congestion. On the skin it often produces itching and several forms of eruption.

Copaiba has been largely used in gonorrhea after the acute symptoms have subsided, also in chronic cystitis, acute and chronic bronchitis, and in dropsies, particularly ascites. In all these affections it is a useful remedy, but its nauseous taste and irritant effects on the stomach are driving it out of fashion, especially in private practice. One eminent surgeon declares not only that it is useless in gonorrhea but that it does more harm than good, often prolonging the disease beyond its natural limit. In psoriasis and urticaria, and in cutaneous affections characterized by torpid peripheral circulation, this drug has been administered internally with excellent results. In long-standing cystitis in the female Copaiba has been injected into the bladder with great benefit. The resin is the most active ingredient, especially for diuretic purposes.

CORIANDRUM, Coriander,—is the fruit of *Coriandrum sativum*, a plant of the nat. ord. Umbelliferæ. It contains a volatile and a fixed oil. Dose, gr. x–xx.

Oleum Coriandri, *Oil of Coriander*,—a volatile oil distilled from Coriander. A colorless liquid, of aromatic, bitter and pungent taste; soluble in 10 volumes of alcohol, forming a slightly turbid liquid neutral to litmus paper. Dose, ♏ij–v.

Coriander is stimulant, aromatic and carminative. It is used almost wholly as a flavoring to other remedies, or as a corrective against the griping effects of certain purgatives. Its flavor covers the taste of Senna and Rhubarb, and it is an ingredient of the official Confectio Sennæ.

CORNUS, Dog-wood (Unofficial),—is the bark of the root of *Cornus florida*, a small tree of the nat. ord. Cornaceæ, indigenous to the U. S. It contains a bitter principle named *Cornin*, which is crystallizable and soluble in water and in alcohol; also a resin and tannic acid.

Cornus is a simple bitter, having stomachic and other qualities similar to those of Calumba (which see). In addition it is possessed of considerable antiperiodic power, and has a good deal of reputation in the Southern States as a remedy in malarial fever, the physicians of that section considering it as next to quinine in efficiency. Heat destroys its active principle, consequently a decoction is a useless preparation. A fluid extract is on the market, the dose of which is ♏x–ʒj.

COTO, Coto Bark (Unofficial),—is the bark of some unknown tree growing in Bolivia. It contains an acrid, bitter principle, of yellow color, crystalline and soluble in hot water and in alcohol, named *Cotoin*, $C_{22}H_{18}O_6$; also *Piperonylic Acid*, $C_8H_6O_4$, and a volatile oil, resin, etc., but no tannin. Dose, gr. j–xv.

Paracoto Bark, *False Coto.*—Its principle, *Paracotoin*, $C_{19}H_{12}O_6$, has a strong similarity to Cotoin therapeutically, but is less active.

A fluid extract of the official strength is prepared, also a tincture (10 per cent.), which may be administered in doses of from ♏j–xx. Cotoin is used in doses of gr. j–iv, and Paracotoin in somewhat larger quantities.

The physiological action of Coto has not been studied, all that is known about it being that it is decidedly irritant to the skin and mucous membranes. After its internal administration the urine takes a dark-red color with Nitric Acid. Ferric Chloride blackens a dilute solution of Cotoin, but has no reaction with Paracotoin.

The bark and both principles are highly recommended in diarrheas of various forms, especially those of phthisis, typhoid fever, and cholera. In Asiatic cholera Paracotoin has been used hypodermically in 3-grain doses with success. When there is any tendency to acute inflammation of the gastro-intestinal tract this agent must be used with caution. Small doses of the tincture (♏j–v) are said to be very effective in the diarrhea of children.

CREOSOTUM, Creosote,—is a mixture of phenols, chiefly *Guaiacol* and *Creosol*, also *Methylcreosol* and *Phlorol*, obtained during the distillation of wood-tar, preferably of that derived from the Beech. It occurs as an almost colorless, or pinkish, inflammable, oily liquid, of smoky odor, caustic taste, and neutral reaction; soluble in about 150 of water, and in all proportions in absolute alcohol, ether, chloroform, benzin, carbon disulphide, acetic acid, and fixed and volatile oils. It does not coagulate albumin (?) or collodion while Carbolic Acid does. It was named from its remarkable preservative power over meat (*creas*, flesh, *sohzoh*, preserve). Much of the commercial Creosote is an impure carbolic acid, or a heavy oil distilled from coal-tar and containing carbolic and cresylic acids. Dose ♏j–iij, well diluted, in wine or whiskey. Morson's beechwood creosote is the best for internal use. There is only one official preparation, viz.—

Aqua Creosoti, *Creosote Water*,—is a 1 per cent. solution, containing nearly 5 minims of Creosote in each fluid-ounce. Dose, ʒj–℥j.

Unofficial Derivatives.

Guaiacolum, *Guaiacol, Methyl Pyrocatechin*, $C_6H_4OHOCH_3$,—is the most active ingredient of Creosote, of which it constitutes from 60 to 90 per cent. It occurs as a colorless liquid, highly inflammable, of a powerfully aromatic odor, very slightly soluble in water, readily soluble in alcohol. Dose, ♏j–xv, in capsules, pills, or alcoholic solution.

Guaiacoli Carbonas, *Guaiacol Carbonate, Duotal*,—is a tasteless and odorless crystalline powder, insoluble in water. Dose, gr. iij–v or more, gradually increased to a maximum of 90 grains per diem.

Creosoti Carbonas, *Creosote Carbonate, Creosotal*,—is a patented product, prepared directly from beechwood creosote instead of guaiacol, and is analogous to guaiacol carbonate. It occurs as a thick, brownish, inodorous oil, insoluble in water. Dose, ♏iij–v or more, gradually increased to a maximum of 90 grains per diem.

Benzosolum, *Benzosol, Benzoyl Guaiacol*,—is prepared by heating Guaiacol with Benzoic Acid, and occurs in small, colorless, odorless, and almost tasteless crystals, practically insoluble in water. Contains 54 per cent. of Guaiacol. Dose, gr. v–xv.

PHYSIOLOGICAL ACTION.

Creosote is expectorant, astringent, antiseptic, styptic, escharotic, anesthetic and narcotic. Its action is practically the same as that of Carbolic Acid (see *ante*, page 86), especially upon the heart, respiration and nervous system, but differs from that of the latter in not causing convulsions, and in increasing the coagulability of the blood. It is eliminated by the kidneys and the bronchial mucous membrane, which it stimulates, being quite a good expectorant. In small doses it seems to have a selective sedative influence on the terminal nerve-filaments in the gastric mucous membrane. In large doses it is a powerful poison, resembling Carbolic Acid in its symptoms, except that its nervous effects are even more marked. It explodes when combined with Oxide of Silver in pill, unless previously diluted with an inert powder.

Guaiacol, locally applied, is rapidly absorbed by the skin, and appears in the urine fifteen minutes after its application. Applied by painting it over the skin of the thigh, abdomen or chest, in quantity of 20 to 50 minims, it causes a rapid reduction of body-temperature, and thereby the temperature in malarial fever, typhoid fever and pneumonia falls as much as 7° in the course of an hour or two, but soon rises again (Da Costa). This rapid antipyretic action is not accompanied by any marked disturbance of the nervous system or any signs of collapse, not even by a very profuse sweat, neither does there occur any active chill, though slight chilliness is sometimes experienced. Guaiacol is said to be a powerful local anesthetic, equal in this respect to cocaine and much safer, as it can be injected in ten times larger doses without producing ill effects. For this purpose it is used in sterilized olive oil (1 in 10 or 20) hypodermically, and it is claimed that thereby perfect local anesthesia is obtained for the extraction of teeth, the removal of small tumors, and similar operations. Internally administered, the action of Guaiacol is similar to that of Carbolic Acid, and overdoses may prove equally fatal.

Wyss, of Zurich, reports the case of a girl nine years of age who had been accidentally given 75 drops of guaiacol. In a short time she became unconscious, the conjunctivæ became injected, the corneal reflexes diminished, and the pupils no longer reacted to light; there were frequent attempts at vomiting, and the saliva flowed from the mouth in large quantities. The pulse became rapid and the sensibility of the skin much diminished. Finally, the patient began to vomit,—the physician detecting the odor of guaiacol the stomach was washed out, but she did not rally. The cyanosis gradually diminished, and instead of it a deadly pallor was observed and the respiration became frequent. Three and a half hours after the guaiacol had been swallowed the patient passed one hundred cubic centimeters of brownish-red urine. The spleen and liver soon enlarged, the temperature fell to 96° F., and small hemorrhages were observed upon the skin of the arms and legs. The urine contained albumin, blood, and casts, and Ehrlich's carbolic-acid test was positive. Jaundice soon appeared, the stupor increased, and the patient died on the third day. The autopsy revealed an acute gastritis and enteritis, parenchymatous degeneration of the liver, acute hemorrhagic nephritis, parenchymatous degeneration of the heart-muscle, and ecchymoses in the pleuræ, peritoneum, endocardium and pericardium; the spleen was much enlarged.

THERAPEUTICS.

Creosote, being a very complex substance of varying composition, has been almost entirely supplanted in therapeutics by Carbolic Acid for external use, and by Guaiacol for internal administration. As an astringent it has been employed in intestinal hemorrhage, gonorrhea and gleet, and generally in the same affections as Carbolic Acid. Externally it is a good application in eczema, pruritus, ulcers and scaly skin diseases, and it effectually relieves the pain of an exposed dental nerve if applied thereto. It is a good agent by inhalation in chronic bronchitis and gangrene of the lung, and it has been administered internally with decided benefit in abnormal fermentative processes in the stomach and intestines, in reflex nausea and vomiting, as from sea-sickness, pregnancy, etc.; also as an aseptic expectorant in chronic basilar cavity, in which it seems to have greater efficacy than any other remedy, and in bronchitis, pulmonary gangrene, carcinoma of the stomach and diabetes.

In pulmonary tuberculosis, when well borne by the stomach, and continued over a long period of time, it has probably proved more efficient than any other remedy. Its employment in this disease is based on the statement of Guttmann, that tubercle bacilli are destroyed by blood which contains ½ per 1000 of Creosote, while even one-half that proportion arrests their growth. The commencing daily dose of Creosote or Guaiacol is 2 or 3 minims, largely diluted to prevent irritation, taken after meals, and increased by the addition of one minim daily until a maximum daily dosage of 15 to 18 minims is reached, at which rate it should be continued for several months. Under this treatment cough is relieved, expectoration diminished, night-sweats are stopped, the fever is lowered, while body-weight and appetite are increased in most cases; and in many even the local conditions are decidedly improved, as shown by the physical signs. Recent researches indicate that the good effects of this treatment are due to the formation of soluble compounds between the remedy and the toxic albuminous by-products of the tubercle bacillus, which are then eliminated from the blood.

Creosote was advocated for phthisis by Reichenbach in 1833, and its use was revived by Bouchard and Gimbert in 1877, since which time it has been tried and approved by a long list of authorities, including Jaccoud, Dujardin-Beaumetz, Dieulafoy, Germain Sée, Sommerbrodt, Von Brun, Guttmann, Douglas Powell, Burney Yeo, J. Solis-Cohen and many others, who all agree as to its utility, though differing as to its mode of action, its dosage, and the methods of administration. The number of cases dealt with by some of these observers is so considerable that there is at least strong *primâ facie* evidence in favor of this drug and its derivatives. Bouchard reported on 93 cases at first, and on more subsequently; Sommerbrodt's report included over 5,000 cases, treated during more than nine years; and Von Brun dealt with 1,700 cases. Professor Sommerbrodt contends that it is possible to administer the quantity necessary to inhibit the growth of the bacilli, and believes that he did so in many cases. He had the most gratifying success with this medication, and states that the more creosote the patient could bear the better was the result. Of late years the tendency has been to administer Creosote or Guaiacol by hypodermic injection. Lepine uses creosote dissolved in oil, and finds that a much larger quantity can be used hypodermically than the stomach will tolerate. Picot injects a mixture of sterilized olive oil containing 1 per cent. of Iodoform and 5 per cent. of Guaiacol, beginning with 1 cc. of the mixture and increasing the dose to 3 cc. He states that no swelling or other local reaction follows this injection. Burney Yeo has used the same method with a more concentrated formula for the injection.

Tinctura Croci, *Tincture of Saffron*,—10 per cent. Dose, ʒj–ij.

Saffron Tea, so much used in domestic practice, is an infusion of *Carthamus tinctorius*, the Safflower.

Crocus is a stimulant aromatic, having some antispasmodic and anodyne qualities. The hot infusion produces diaphoresis, probably by virtue of the hot water alone. It is said to have caused death with narcotic symptoms. On the continent of Europe it is employed as a stimulant and emmenagogue, but in this country its only use is as a coloring agent. The miscalled Saffron Tea noted above is used in domestic practice for measles and other exanthemata.

CUBEBA, Cubeb,—is the unripe fruit of *Piper Cubeba*, a plant of the nat. ord. Piperaceæ, cultivated in Java. It contains a *Volatile Oil*, which is official, an acrid resin composed in part of *Cubebic Acid*, also a fatty oil, gum, and *Cubebin*, which is an insoluble, neutral, odorless and tasteless body. The volatile oil may be separated into *Cubebene* a camphor, and *Cubeben* a liquid portion. The active principles are the volatile oil and cubebic acid, both of which are contained in the oleoresin. Cubeb should be kept whole and not pulverized until wanted for use. Dose of the powdered drug, gr. x–ʒij.

Preparations.

Extractum Cubebæ Fluidum, *Fluid Extract of Cubeb*. Dose, ♏v–xxx.

Tinctura Cubebæ, *Tincture of Cubeb*,—20 per cent. Dose, ♏x–ʒiij.

Oleoresina Cubebæ, *Oleoresin of Cubeb*,—extracted by ether. Dose, ♏v–xxx.

Trochisci Cubebæ, *Troches of Cubeb*,—each contains of the Oleoresin 4, Oil of Sassafras 1, Extract of Glycyrrhiza 25, Acacia 12, and Syrup of Tolu q. s. to form 100 troches. Dose, j–iij.

Oleum Cubebæ, *Oil of Cubeb*, $C_{15}H_{24}$,—is the volatile oil, a colorless or pale greenish-yellow liquid, of sp. gr. 0.920, warm, aromatic taste, odor of cubeb and neutral reaction. Is soluble in an equal volume of alcohol. Dose, ♏v–xx.

Cubeb belongs to the pepper family, and like black pepper is an aromatic stomachic and a stimulant diuretic in small or medium doses, but large doses derange digestion and may act as a gastro-intestinal irritant. Its constituents are eliminated by the bronchial mucous membrane, the skin and the kidneys, stimulating and disinfecting the genito-urinary passages, increasing the bronchial mucus, sweat and urine, and frequently causing an urticarial or vesicular eruption. It increases the action of the heart and of the vascular system, stimulates the venereal appetite, and promotes the menstrual discharge.

Cubeb is particularly useful in affections of the bladder and urethra. It is used in the acute stage of gonorrhea, in chronic cystitis, prostatorrhea and chronic bronchitis with excellent results. The powder is a good application in hay-fever, chronic nasal catarrh and follicular pharyngitis, blown on to the mucous membrane by an insufflator. It may also be smoked in cigarettes with temporary relief in cases of acute nasal catarrh with "stuffed" nasal passages. In some subjects the continued use of cubeb produces nausea, hemorrhoids, hematuria, and severe headache. The troches are a useful preparation in chronic irritability of the fauces, pharynx and air-passages, and are much employed by singers and public speakers for their tonic effect on these parts and for the relief or prevention of hoarseness.

CUPRUM, Copper, Cu,—is not official, but one of its salts is, namely the Sulphate. The metal itself is inert, but in combination it is actively poisonous. Copper has been found in the normal human blood in very minute quantity.

Salts and Preparations of Copper.

Cupri Sulphas, *Copper Sulphate,* $CuSO_4 + 5H_2O$,—blue, translucent crystals, efflorescent, of nauseous, metallic taste and acid reaction, very soluble in water, insoluble in alcohol. Its solution is blue by transmitted light, green by reflected light. Dose, as an emetic, gr. ij–v, every 10 or 15 minutes,—as a tonic, gr. 1/6–1/2.

Alkaline Cupric Tartrate Volumetric Solution, *Fehling's Solution,*—the official reagent for glucose, is prepared as follows: (1) Dissolve 34.64 grammes of pure Cupric Sulphate in water, to measure exactly 500 cubic centimeters. (2) Dissolve 175 grammes of Potassium and Sodium Tartrate and 125 grammes of Potassium Hydrate in water to measure exactly 500 cubic centimeters. Keep the two solutions in small, rubber-stoppered bottles, separate; and for use, mix exactly equal volumes of the two at the time required. One cubic centimeter of the mixed solution is the equivalent of—

Cupric Sulphate, crystallized, $CuSO_4 + 5H_2O$, ...	Gramme,	0.03464
Cupric Tartrate, $CuC_4H_4O_6 + 3H_2O$, ...	"	0.03685
Glucose, anhydrous, $C_6H_{12}O_6$, ...	"	0.00500

Cuprum Ammoniatum, *Ammoniated Copper* (Unofficial),—is made by triturating 3 parts of Ammonium Carbonate with 4 of Cupric Sulphate until effervescence has ceased, then drying. A deep azure blue powder, of ammoniacal odor, a styptic, metallic taste, and alkaline reaction, soluble in water. Dose, gr. 1/6–j.

Cupri Arsenis, *Copper Arsenite,*—is described under ARSENUM, *ante,* page 199.

PHYSIOLOGICAL ACTION.

The salts of Copper are gastro-intestinal irritants, producing a metallic taste, nausea with greenish vomited matter, purging of blood and mucus, constricted fauces, depressed heart action, hurried respiration and fever. Or, as with Arsenic, gastro-enteritis may not occur, but instead profound nervous symptoms, as headache, defective coördination, coma and convulsions. The symptoms of chronic poisoning are bronchial irritation and catarrh, gastro-intestinal catarrh, colic with diarrhea [Lead produces colic with constipation], dysentery, nausea, emaciation, anemia, salivation, and a green line (sulphide) along the margin of the gums in those who do not clean their teeth. The nervous symptoms above mentioned are also usually well marked. The liver becomes atrophied from irritation of its connective tissue and fatty degeneration of the hepatic cells. The lungs are congested, even pneumonic consolidation may be set up, the metal seeming to have affinity for the pulmonary parenchyma. These effects are often produced by the inhalation of cuprous fumes, and by eating acid fruits cooked in a copper vessel. Brass-founding is known to cause various forms of disease, as gout, chronic nephritis, progressive paresis of the legs, tremor, muscular wasting, and locomotor ataxia. A group of symptoms known as "brass founders' ague," has also been noticed. The fit of ague is ushered in by languor and depression, then follow prostration with pallor, cold sweats, and chills, which may even amount to rigors, with chattering of the teeth, precordial anxiety, headache, nausea and muscular pains. The onset of vomiting arrests the symptoms and usually is followed by sleep, from which the patient awakens almost well. It is not clear whether these symptoms are due to copper or to zinc, both of which enter into the composition of brass.

Copper Sulphate is a simple, irritant emetic, producing prompt and continued vomiting with but little nausea or depression. In small doses it is a nerve-tonic, and is astringent to the gastro-intestinal tract. Externally applied in solution it is a useful stimulant and astringent to diseased mucous surfaces, and is mildly caustic if used in substance. The Acetate is possessed of the same general action as the sulphate. Its local action is stimulant and escharotic. The impure acetate (verdigris) is a violently irritant poison. Ammoniated Copper has no special action other than that of the sulphate.

Antidotes, Antagonists and Incompatibles.

Potassium Ferrocyanide is the antidote in poisoning by the Copper Salts, but Albumin or Magnesia may be used. Any chemical antidote should be followed by prompt evacuation of the stomach, then *Opium* and demulcents for gastro-enteritis, and *Potassium Iodide* even to saturation of the system. Alkalies and their Carbonates, Lime-water, Iodides, and Mineral Salts (except the sulphates), are all incompatible.

THERAPEUTICS.

The Sulphate is a prompt and efficient emetic, and is so used in croup and narcotic poisoning. In phosphorus poisoning it forms a comparatively insoluble phosphide of copper besides producing emesis. Fifteen or twenty grains may be dissolved in ℥iv of water, and a teaspoonful or more, according to age, given every ten minutes until vomiting is produced. In acute diarrhea and chronic dysentery it is the best metallic astringent in doses of gr. $\frac{1}{12}$ to $\frac{1}{10}$ with Opium, and in gastro-intestinal catarrh it is equally efficient. Locally, it is used with benefit in throat affections, gonorrhea, granular lids and corneal ulcers, indolent granulations and chronic inflammations of mucous membranes. In most of these affections weak solutions (gr. ⅛ to ¼ to the ℥) are best, but in granular conjunctivitis the smooth crystal may be rubbed quickly over the surface once daily.

In various nervous diseases, as epilepsy, chorea, hysteria, etc., the salts of copper are sometimes beneficial, the Ammoniated Copper being con-efficient antagonist, maintaining life until elimination occurs. Evacuation of the bladder repeatedly is important to prevent reabsorption. The caustic alkalies destroy Curarine as they do all other alkaloids.

Curare is chiefly used for experimental purposes on the lower animals. It has an historical interest from its having been the means by which Bernard demonstrated the existence of muscular contractility as an essential endowment of that tissue. It has been used with some success in spasmodic nervous affections, particularly in tetanus, both idiopathic and traumatic, in hydrophobia, chorea and epilepsy. It does not promise well as a therapeutic agent, but undoubted cases of hydrophobia are reported by high authority as cured by this drug.

CUSSO, Kousso, *Brayera*,—is the female inflorescence of *Hagenia abyssinica*, an Abyssinian tree of the nat. ord. Rosaceæ. It contains tannic acid, a volatile oil, and a crystalline principle named *Koussin*. Dose, of Cusso, ʒij–℥j.

Extractum Cusso Fluidum, *Fluid Extract of Kousso.*—Dose, ʒij–℥j.

Cusso has little or no effect except the nausea, vomiting, colic and slight diarrhea produced by large doses. Its chief action is anthelmintic against both varieties of tapeworm, but it rarely expels the head of the parasite, and is very nauseous to the taste and difficult of retention by the stomach in the large doses necessary to efficiency. From ʒij to ℥j of the flowers infused in ℥iv of boiling water is the usual dose, which should be taken on an empty stomach and followed by a castor-oil or saline purge after 3 or 4 hours. An emulsion of a 6 per cent. infusion with castor-oil, yolk of egg, a few drops of ether and oil of anise with 10 to 20 drops of the Oleoresin of Male-fern, is more agreeable and efficient than the infusion alone.

CYDONIUM, Quince Seed (Unofficial),—is the seed of *Cydonia vulgaris*, a tree of the nat. ord. Rosaceæ, native in Crete and Austria, and cultivated elsewhere. The seeds placed in water swell up, forming a mucilaginous mass. The mucilage is the only constituent of importance and is contained in the epithelial cells. It has been named *Cydonin*, and is considered to be a compound of gum and cellulose.

Mucilago Cydonii, *Mucilage of Cydonium* (Unofficial),—is prepared by macerating 2 parts of Cydonium in 100 of Distilled Water. Dose, indefinite.

Cydonium is of value for its mucilage, which is used as a bland, demulcent application in conjunctivitis, abrasions of the skin, and fissures of the mucous membranes, and as a vehicle for injections in gonorrhea. Internally it may be used as a soothing remedy for the throat, stomach, or intestines. The preparation known as *Bandoline*, used as a hair-dressing, is identical with mucilage of Cydonium.

CYPRIPEDIUM, Ladies' Slipper,—is the rhizome and roots of *Cypripedium pubescens*, and of *C. parviflorum*, the Moccasin-plant, or American Valerian (nat. ord. Orchideæ). It contains a volatile oil, a volatile acid, resins, and tannin.

Extractum Cypripedii Fluidum, *Fluid Extract of Cypripedium.*—Dose, ♏x–xxx.

Cypripedin (Unofficial),—is an impure alcoholic extract. Dose, gr. ss–ij.

Cypripedium is antispasmodic, tonic, stimulant and diaphoretic, possessing the same general properties as Valerian, whence one of its common names, American Valerian. It is a popular remedy in some parts of the U. S. for nervous hyperesthesia unaccompanied by organic lesions, and especially in morbid sensibility of the eye. It is reported to have even cured epilepsy, and is said to be highly useful in neuralgia, hysteria, nervous headache and insomnia.

DAMIANA (Unofficial),—the leaves of *Turnera aphrodisiaca*, a plant of the nat. ord. Turneraceæ, growing in Mexico and Lower California. Several varieties of so-called Damiana are in the market, but the true leaf is of a light-green color, small, lanceolate, and dentate along the margin. It contains a volatile oil and a resin. Dose, ℥j daily.

Extractum Damianæ, *Extract of Damiana* (Unofficial).—Dose, gr. ij-x.

Extractum Damianæ Fluidum, *Fl. Ext. of Damiana* (Unof.).—Dose, ♏x-ʒj.

Damiana is said to be a powerful aphrodisiac in cases of sexual atony, but the published reports of its use since its introduction vary greatly as to its efficacy. It is probably a stimulant diuretic, a bitter tonic, and a purgative in sufficient doses. Besides its use as an aphrodisiac Damiana has been administered with benefit in some forms of cerebral exhaustion and general atony of the nervous system, also in sick headaches and in some few cases of paralysis. It forms the chief stock in trade of the numerous charlatans who fill the daily papers with advertisements of "manhood-restorers."

DATURA TATULA (Unofficial),—is an indigenous plant of the nat. ord. Solanaceæ, resembling Stramonium very closely, with which it generally agrees in its physiological action and therapeutics. It is distinguished by its purple stem, purple flowers and anthers, and the darker green of its leaves. It probably contains the alkaloid *Daturine* (see STRAMONIUM),—and has been smoked in asthma, in a few cases giving continued relief when Stramonium had failed to render any service.

DIGITALIS, Foxglove,—Digitalis consists of the leaves, collected from plants of the second year's growth, of *Digitalis purpurea*, the Purple Foxglove, a plant of the nat. ord. Scrophularineæ, which grows wild in Europe, and is cultivated in this country, often in private gardens for its beautiful spike of purple flowers, and largely by the Shakers for the drug market.

The British Phar. directs that the official drug shall consist of "the dried leaf, collected from the *wild*, indigenous plant, when about two-thirds of the flowers are expanded." Much of the leaf found in our shops is of very poor quality, a large proportion being inert; but whether this is due to our Pharmacopœia not restricting the official drug to the wild plant, or to careless treatment in gathering and drying, is not definitely known. When, however, the leaves are imperfectly dried, a process of decomposition sets in, which destroys the active principles, and may produce new and poisonous ones. A similar decomposition is said to occur whenever the tincture of Digitalis is mixed with watery or syrupy solutions. Certain it is, at any rate, that Digitalis is one of the most unreliable drugs, in respect to the physiological activity of any particular sample or preparation. The seeds are known to contain the active principles in much greater proportion than the leaves, but they are never used.

Constituents of Digitalis.

The supposed active principle of Digitalis was first designated by the term *Digitalinum* (Digitalin), under which name a substance was official in the U. S. Phar. and a process was given therein for its extraction, until the revision of 1880, when it was omitted. It was an amorphous product, of complex composition, and did not represent Digitalis. In 1871 Nativelle received the Orfila prize from the French Academy for the discovery of a crystalline principle in Digitalis, which he named *Digitaline*. This was supposed to be the active principle of the plant, until Roucher (1872) and Schmiedeberg (1875) found it to be a complex body consisting of a mixture of Digitalin and Digitoxin.

Schmiedeberg's latest analysis is now accepted as the most accurate determination yet obtained of this vexed question. He enumerates five principles as contained in Digitalis, namely—

(1) **Digitalin,** a granular glucoside, soluble in alcohol, almost insoluble in water, sparingly soluble in ether or chloroform; possesses in a high degree the medicinal action of digitalis; the active ingredient of Homolle's French Digitaline and the Digitalin of the U. S. and Br. Pharmacopœias.

(2) **Digitoxin,** a crystalline glucoside, soluble in alcohol, slowly in chloroform, sparingly in ether, quite insoluble in water; the most toxic of all the constituents, but uncertain, cumulative and dangerous in its action; the principal constituent of Nativelle's prize Digitaline.

(3) **Digitaleïn,** an amorphous glucoside, soluble in both water and alcohol, insoluble in ether or chloroform. Its action on the heart is non-cumulative and it causes no irritation when subcutaneously injected.

(4) **Digitonin,** a crystallisable glucoside resembling *Saponin*, soluble in water, insoluble in cold alcohol, ether or chloroform. It is perhaps the diuretic agent.

(5) **Digitin,** a crystalline body, insoluble in ether or chloroform, scarcely soluble in water, more readily in alcohol. It is physiologically inert.

The first three are cardiac stimulants and are highly poisonous. Digitonin is a direct depressant of the heart and antagonizes the stimulant action of the others. All five are non-nitrogenous, and except Digitin are glucosides. Digitalis contains no alkaloid.

Official Preparations.

Digitalis, *Digitalis,*—the powdered leaves. Dose, gr. ss–iij.

Extractum Digitalis, *Extract of Digitalis,*—By maceration and percolation in Alcohol 2, Water 1, distilling off the alcohol, and evaporating the residue. Dose, gr. ¼–j.

Extractum Digitalis Fluidum, *Fluid Extract of Digitalis,*—By maceration and percolation in Alcohol 2, Water 1, and evaporation. Dose, ♏ss–iij.

Tinctura Digitalis, *Tincture of Digitalis,*—Digitalis 15, Diluted Alcohol to 100. By maceration and percolation. Dose, ♏v–xx.

The Tincture and Fluid Extract, being alcoholic preparations, contain Digitalin, Digitoxin and Digitaleïn, which are soluble in alcohol and represent the cardiac action of the drug itself. On the addition of water to these preparations, the Digitoxin is precipitated. The Infusion contains Digitonin and Digitaleïn but practically no Digitalin or Digitoxin, and is the best preparation for diuretic purpose. The Tincture is the best for the cardiac action; but to obtain the action of the plant itself the powdered leaves must be used in pill or capsule. To obtain the best action of the Tincture on the heart, it should be administered without admixture, or at least, with water alone, the latter being added immediately before ingestion and any precipitate being also swallowed.

Infusum Digitalis, *Infusion of Digitalis,*—Digitalis 1½, Alcohol 10, Cinnamon Water 15, Boiling Water 50, Water to 100. By maceration in boiling water. Dose, ʒj–iv. Notice that the dose is in drachms, not in ounces. The British Infusion has only ½ the strength of the above and is given in doses of ʒij–iv. In France a cold infusion is preferred, 5 grains of the powdered drug being macerated in 4 ounces of cold water for 8 to 12 hours and then filtered. The dose is ℥ss every two hours.

Unofficial Preparations.

Digitalinum, *Digitalin,*—is the complex product of the process formerly official in the U. S. and Br. Phar. Dose, gr. $\frac{1}{60}$–$\frac{1}{30}$.

Homolle's (or **Quévenne's**) **Digitalin,**—is much used in France in form of granules. Consists chiefly of Digitalin with a little Digitoxin, and possesses the action of the leaves. An amorphous, yellowish-white powder or small scales, intensely bitter, inodorous, but irritant to the nostrils. Dose, gr. $\frac{1}{65}$, equal to about gr. jss of the powdered leaves.

Nativelle's Digitaline,—consists largely of Digitoxin, and is cumulative in action. Light, white, crystalline tufts of needles, of very bitter taste; soluble in alcohol, insoluble in water. Dose, gr. $\frac{1}{60}$–$\frac{1}{30}$ in pill.

Digitalinum Verum, is the distinguishing name given by Kiliani to Schmiedeberg's Digitalin, which he believes to be the best form in which to prescribe Digitalis. Its composition is definite, it is obtainable commercially in a sufficiently pure condition, it possesses all the medicinal action of Digitalis on the heart, and it is non-cumulative. It is soluble in 100 of 50 per cent. alcohol and in 1000 of water. Dose, gr. $\frac{1}{100}$ every 2 or 3 hours.

PHYSIOLOGICAL ACTION.

Digitalis is a cardiac and vascular stimulant, a diuretic in certain conditions, an emetic to some persons, hemostatic, anaphrodisiac, excito-motor and at last a paralyzant. In over-doses it irritates the mucous membranes, causing sneezing, severe gastric disturbance, nausea, vomiting, colic and purging, the discharges being of a grass-green color. In such doses it lowers temperature, probably by lessening the blood-supply to the tissues, produces headache, irregularity of the heart's action, vertigo and an appearance of vibratory fringes of color around objects.

Digitalis slows the action of the heart but increases its force at the same time. It stimulates the cardiac muscle and its inhibitory apparatus, and also stimulates the vaso-motor centres, contracting the arterioles and thereby greatly raising arterial tension. The continued use of full doses dilates the blood-vessels, exhausts the irritability of the cardiac motor ganglia, and finally paralyzes the cardiac muscle itself. The recumbent posture must be maintained when Digitalis is given for its full cardiac effects. Its final effect on striped muscular tissue is to lessen the contractile power, causing great weakness and languor. Under its influence the excretion of urea is at first increased, but soon decidedly diminished. It lessens the sexual appetite and impairs the venereal function. Lethal doses lessen the reflexes by stimulation of Setschenow's centre, and paralyze the muscles and the peripheral nerves, motor and sensory. Respiration, at first slowed, becomes rapid and feeble; cyanosis, coma and convulsions follow, also death by sudden paralysis of the heart, which is arrested in systole.

It has been conclusively shown that in many cases of pneumonia Digitalis failed to influence the pulse, the result probably of the partial paralyzant influence of high body-temperature upon the vagus centre and endings in the heart, thus weakening the inhibitory apparatus to such a degree that the drug awakens no responsive increase of inhibition. In cases with but moderately high pyrexia the characteristic action of the drug is not interfered with.

Compared with Aconite, both this drug and Digitalis slow the heart, but otherwise their actions are antagonistic. Aconite at first stimulates and soon relaxes inhibition and depresses the cardiac motor ganglia,—Digitalis increases inhibition and stimulates the cardiac muscle. Both drugs finally paralyze the heart, Aconite by direct depression of its motor ganglia, Digitalis by over-stimulation of the cardiac muscle. Under Aconite the heart is arrested in diastole, under Digitalis in systole. The arterial tension is lowered by Aconite but is raised (at first) by Digitalis. Aconite acts quickly, Digitalis very slowly,—a fact which makes the latter drug of little value in poisoning by the former.

During the use of this drug for any length of time the muscle of the heart is so strained by over-stimulation that on suddenly assuming the erect position the cardiac energy may fail, more especially if the doses are administered too close together to admit of the elimination of one before the ingestion of the next. This is the explanation of the so-called cumulative action of Digitalis, which is not now generally recognized in the sense in which the term was formerly applied. Another explanation is that it may stop its own excretion, by arresting the renal circulation and the secretion of urine through extreme contraction of the renal vessels, and thus may really accumulate in the blood.

The diuretic action of Digitalis is not yet fully understood. All authorities agree that this action is exercised indirectly through the circulation, but many differ in regard to its details. One theory is that the constituent principle Digitalin contracts the bloodvessels all over the body, while others (Digitoxin and Digitaleïn or perhaps Digitonin) dilate the renal arteries. The effect of this, together with the increased force of the ventricular contractions caused by the drug, is to greatly raise the general arterial tension and consequently to increase the bloodpressure in the glomeruli; while the rapidity of the renal circulation is increased and its volume augmented by the strengthening of the cardiac contractions and the dilatation of the afferent renal vessels. If this explanation be true, no other drug possesses such double power, and so far as vascular action is concerned Digitalis is the ideal diuretic. Another theory is that when a small dose is given, or during the first stage of a large dose, the renal arteries contract as do the other arteries of the body, but they are the first to dilate under the continued influence of the drug, which then acts as a diuretic.

It is generally conceded that Digitalis has some diuretic power in health, but that this is slight compared with the diuresis produced by it in cases of dropsy, especially when due to cardiac disease. Much uncertainty exists as to its effect upon the constituents of the urine, some maintaining that it increases the elimination of urea, others that this is diminished, and still others that it is at first increased and afterwards diminished.

Antidotes, Antagonists and Incompatibles.

Tannic Acid is the chemical antidote, but as the tannate is not inert the stomach should be evacuated. *Aconite* is the best antagonist to the effects of large doses, *Opium* to those of its long-continued use. *Saponin* and *Senegin* are considered to be its most complete physiological antagonists. Incompatibles are Cinchona, Iron Sulphate, Tincture of Ferric Chloride, and Lead Acetate; also syrupy and watery solutions, which may precipitate and decompose the active principles of the plant.

THERAPEUTICS.

The employment of Digitalis in disease is chiefly based on its action as a cardiac tonic and a diuretic. The forms of heart disease in which it is indicated are the affections of the auriculo-ventricular orifices, namely, mitral and tricuspid disease, whether regurgitant or obstructive in character. It is contra-indicated in aortic disease, except for special symptoms, and especially in fatty degeneration of the cardiac muscle. Its particular sphere of usefulness is *Mitral Regurgitation*, especially when accompanied by venous engorgement and edema of the lungs, the right heart, the liver, kidneys and subcutaneous tissues. In such cases its action is shown to striking advantage, ameliorating all the symptoms by assisting the flow of blood in the veins. By prolonging the diastole, it gives time for the dilated auricle to empty itself through the incompetent orifice; and by strengthening the contraction of the left ventricle, it causes the better approximation of the mitral flaps, consequently less regurgitation occurs, less venous engorgement, and the propulsion of more blood into the arterial system. If it also acts as a diuretic, as it usually does in these cases, the diuresis will tend to remove the edema; and the general improvement in the circulation produced by it will relieve the cardiac pain and distress, the dyspnea and cyanosis. The less a case of mitral regurgitation approaches the edematous type, the less good will Digitalis do as a rule.

In *Mitral Constriction*, Digitalis is usually of great assistance, the lengthened diastole giving more time for the blood to pass through the narrowed orifice, and the increased force of the auricular contraction helping in the same direction.

In *Tricuspid Regurgitation* or *Constriction*, Digitalis is beneficial in the same manner as in disease of the mitral valve. It is particularly useful in dilatation of the right side of the heart with incompetence of the tricuspid. The rational symptoms which indicate its use are—rapid and feeble cardiac action, low arterial tension, cough, dyspnea, pulsating jugulars, a dusky face, scanty and high-colored urine and general dropsy.

In *Aortic Regurgitation*, Digitalis is generally injurious; the prolonged diastole caused by it giving more time for the blood to regurgitate through the imperfectly closed orifice, and thus increasing the danger of fatal syncope. It may do good if compensatory hypertrophy has not set in, if the heart is feeble and its action rapid, or when there is but little blood regurgitating, or when there are reasons, such as the coincident presence of aortic obstruction, for wishing to strengthen and regulate the contraction. In any case, the dose administered should be a small one, and its effects should be carefully watched.

In *Aortic Constriction*, Digitalis is generally contra-indicated, especially when, as is usually the case, this lesion is accompanied by aortic regurgitation. It may be of service, however, when the force of the heart-beat requires strengthening; or when, as a result of the obstruction, mitral dilatation has set in, with much regurgitation and the consequent venous and pulmonary engorgement. It should not be used in aortic stenosis with compensatory hypertrophy, in simple hypertrophy when compensated, in pericarditis or in fatty degeneration of the heart, except temporarily for some special indication.

In the irritable heart of soldiers Digitalis is often curative, and palpitation, cardiac failure and venous engorgement are well treated by it. In exophthalmic goitre it has apparently benefited some cases, when used over a long course of treatment; but, as a rule, this affection is not amenable to its influence.

Digitalis is not a suitable diuretic in Bright's disease, though it has been used with benefit in the early stage of the acute form. If its action produces dilatation of the renal arteries it is questionable practice to increase the circulation in any acutely inflamed organ; while on the other hand the arterial tension is always raised in such cases, and this drug only aggravates that condition. In chronic Bright's disease it is still more injurious, for the same reason, the arterial tension being already very high therein. It may be of service, however, in cases of renal cirrhosis, when the cardiac hypertrophy has failed to overcome the peripheral resistance, and consequently there is dilatation of the left ventricle and the left auriculo-ventricular orifice, with the resulting mitral regurgitation. In such cases, a diuretic pill is frequently of service, consisting of Digitalis leaves in powder, Calomel and Squill, a grain of each, made into pill with extract of Hyoscyamus.

Digitalis is always an uncertain diuretic unless the heart is diseased; yet it has rendered good service in renal dropsy as well as in the cardiac form. Its contractile power over the arteries may so predominate as to arrest the renal circulation completely, and stop the secretion of urine (Brunton). On this account it is well to administer at the same time an agent which causes dilatation of the renal vessels, as Sodium Nitrite. Contrary to theory it has been employed with benefit in the early stage of scarlet fever, and when the kidneys strike work in that disease. As a hemostatic it may be used in hemorrhage from a large surface, in the hemorrhagic diathesis, hemoptysis, and menorrhagia. As an antipyretic it has been much used in fevers, in the first stage of pneumonia, and in other inflammations, but a reaction is setting in against this employment of so powerful an agent, which by over-stimulation may act as a heart-depressant. In rheumatic fever it lowers the temperature, shortens the duration of the disease, and is particularly indicated for any cardiac complications. It was formerly much used in delirium tremens, in congestive headaches, acute mania and other congestive conditions of the brain, but generally without much benefit. In spermatorrhea of the plethoric it may be well combined with Potassium Bromide, and when this affection is complicated with an atonic condition, shown by feeble erections, frequent emissions, and cold feet and hands, it is a serviceable anaphrodisiac. Finally, Digitalis is said by high authority to be particularly adapted to blondes and persons of sanguine and indolent temperament. Sometimes the vomiting caused by it is so severe as to prevent its use.

Of the four active principles contained in this plant, namely—Digitalin, Digitoxin, Digitaleïn and Digitonin, the first two are soluble in alcohol and practically insoluble in water, the third is soluble in both menstrua and the fourth is insoluble in alcohol but is freely soluble in water. Consequently all alcoholic preparations of Digitalis contain the first three principles and all aqueous ones contain the last two. In action the first three are very similar, producing the characteristic effects of the plant, while Digitonin is directly poisonous to the cardiac muscle, decreasing its contractile power. This principle produces dilatation of the arteries, generally antagonizes the action of the other constituents, and perhaps irritates the renal epithelium. When, therefore, the cardiac action of Digitalis is desired, the tincture should be employed, given on sugar or bread, prohibiting the ingestion of any aqueous fluid within 20 minutes, either before or after swallowing it. If the diuretic action is required, the proper preparation is the infusion. The latter preparation may be employed hypodermically, and very small doses so administered have been found efficient when larger ones given by the stomach have failed to act. An infusion for this purpose is of the strength of 3 parts of the leaf in 100 of water, and the hypodermic dose thereof is 15 minims twice or thrice daily.

DIOSCOREA, Wild Yam, Colic-root (Unofficial),—is the rhizome of *Dioscorea villosa*, a creeping plant of the nat. ord. Dioscoraceæ, indigenous to the eastern U. S. It contains an acrid resin, and is reported to be expectorant and diaphoretic in action, as well as stimulating to the intestinal canal, and in large doses to cause general neuralgic pains with erotic excitement. It is used with great success in bilious colic; and in the cramps of cholera morbus, spasmodic hiccough, dysmenorrhea and nocturnal emissions of sthenic type it is said to be very efficient. A powdered extract named *Dioscorein* is on the market, of which the dose is gr. j–iv. A fluid extract made according to the pharmacopœial rule may be administered in doses of ♏xv–xxx.

DITA BARK (Unofficial),—is the bark of *Alstonia scholaris*, a tree of the nat. ord. Apocynaceæ, growing in the Philippine Islands. It contains two active alkaloids, *Ditaine* and *Ditamine*, the former of which has an action identical with that of Curare. The bark is considered tonic and antiperiodic, and is used in the East as a remedy for intermittents. It may be given in doses of ʒj–iv, in powder or as a fluid extract.

DROSERA, Sundew (Unofficial),—A fluid extract of *Drosera rotundifolia*, the nd-leaved Sundew, is said to have been successfully used in phthisis pulmonalis. It is certainly a most useful agent in whooping-cough and other spasmodic coughs; especially when marked by violent paroxysms, the cough being loud and harsh, and followed by bleeding from the nose or mouth, and perhaps by vomiting of the contents of the stomach. The expressed juice has been applied to warts and corns, for the purpose of curing them. Dose of the fluid extract, ♏v–xx.

DUBOISIA (Unofficial),—is the leaf of *Duboisia myoporoides*, an Australian tree of the order Solanaceæ. It contains a poisonous alkaloid, *Duboisine*, which is believed to be identical with Hyoscyamine, and strongly resembles Atropine.

Unofficial Preparations.

Extractum Duboisiæ, *Extract of Duboisia*,—Dose, gr. $\frac{1}{6}$–$\frac{1}{4}$.
Tinctura Duboisiæ, *Tincture of Duboisia*,—Dose, ♏v–xx.
Duboisinæ Sulphas, *Duboisine Sulphate* (Langenberg's),—Dose, gr. $\frac{1}{100}$–$\frac{1}{30}$.

Physiological Action and Therapeutics.

The actions of Duboisia are in all respects similar to those of its congener, Belladonna, except that Duboisine is more soluble in water than Atropine, is less irritating to mucous membranes, and more prompt in mydriatic action, but its effects are of shorter duration. It is also less of a cerebral excitant and more of a calmative and hypnotic. On man its action is said by some authorities to be more powerful than that of Atropine, but less powerful on frogs. If administered in the intervals between meals it disorders the ensuing digestion, but does not so act if given while digestion is in progress.

Duboisine is highly praised for its sedative action in the mental excitability of the insane, in the treatment of the morphine habit and in paralysis agitans. In doses of gr. $\frac{1}{100}$ to $\frac{1}{75}$ of the sulphate, administered hypodermically twice daily, it induces quiet and refreshing sleep and is not dangerous. When given in larger doses it may produce vertigo, nausea or even syncope, but no fatal cases from its moderate use have been reported (Massant). Its sedative effect is at the same time the most persistent and also that of which the patient first acquires a tolerance. Of 22 cases in which the calmative effect was at first decided, a tolerance was acquired in eight. In such cases the sedative action of the drug may be restored by ceasing its continuous administration and lengthening the interval between the doses (De Montyel). It has been well employed in puerperal mania, and may be used instead of Atropine in many conditions, especially in the night-sweats of phthisis, respiratory neuroses and cardiac failure. It is employed as a mild mydriatic by eye surgeons, its advantages for them over Atropine being its more rapid action in paralyzing accommodation and effecting mydriasis, the shorter duration of its effects and the slight degree of conjunctival irritation produced by it. Duboisine is an efficient antagonist to Morphine. Its own antagonists and incompatibles are the same as for Atropine, and are given under BELLADONNA, *ante*, page 215.

DULCAMARA, Bittersweet,—the young branches of *Solanum Dulcamara*, or Woody Night-shade, a shrub of the nat. ord. Solanaceæ, growing in Europe and N. America. It contains the glucoside *Dulcamarin*, a peculiar principle named *Picroglycion*, and the alkaloid *Solanine*, which exists in the stems of other species of Solanum, namely, *S. tuberosum* (potato), *S. Lycopersicum* (tomato), and *S. nigrum* (black nightshade). *Solanine* is of bitter taste and alkaline reaction, crystallizing in minute prisms which are soluble in 125 of boiling alcohol but very insoluble in water. It is a narcotic poison, but exists in very small quantity in the plant.

Preparations.

Extractum Dulcamaræ Fluidum, *Fluid Extract of Dulcamara*,—Dose, ʒss–jss.

Decoctum Dulcamaræ, *Decoction of Dulcamara* (Unofficial),—may be made of 10 per cent. strength and given in doses of ℥j–ij.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Dulcamara is but imperfectly understood. In overdoses it has produced nausea and vomiting, vertigo, convulsive muscular movements, pruritus, erythematous eruptions on the skin, and languid circulation with a dusky color of the face and hands. In children who have eaten the berries there have been observed signs of severe enteralgia, abdominal tenderness, nausea, thirst, heat in the throat and chest, great prostration, rapid pulse, quick and painful respiration. In very large doses it is a narcotic poison, causing paralysis by depression of the central nervous system, with lowered activity of the heart and respiration. It is believed by some authorities to be anaphrodisiac, diaphoretic and diuretic.

Dulcamara was formerly used in a variety of affections, as herpetic diseases, chronic rheumatism, gout, jaundice, etc. It is now chiefly employed in obstinate scaly skin diseases, as psoriasis and pityriasis, in which it is unquestionably serviceable. It is also serviceable in the diarrhea of children when produced by exposure to cold and damp, in mania with strong venereal propensities, in chronic bronchitis and in whooping-cough. As a diaphoretic it has been used with benefit in rheumatic and venereal disorders, and is often beneficial in nasal pulmonary and vesical catarrhs. It is said to be particularly useful in affections of a rheumatic or catarrhal nature when caused by exposure to damp weather.

ELASTICA, India-rubber, *Caoutchouc*,—is the prepared milk-juice of various species of *Hevea* (nat. ord. Euphorbiaceæ), growing in

S. America, and being known in commerce as Para Rubber. It is very elastic, insoluble in water, diluted acids, or diluted solutions of alkalies, soluble in chloroform, carbon disulphide, oil of turpentine, benzin and benzol. When pure, or nearly pure, it floats on water.

India-rubber is a hydrocarbon, and may be combined with sulphur by the aid of heat (vulcanized), which process, long continued, converts it into hard rubber. It is used in the fabrication of catheters, bougies, pessaries, court plaster, bandages, elastic stockings, tubing, etc. An analogous substance is Gutta-percha, which was official in the U. S. Phar., 1880.

Gutta-percha (Unofficial),—is the concrete exudation of *Isonandra gutta*, a large tree of the nat. ord. Sapotaceæ, growing in the Malay peninsula and adjoining islands. It occurs in tough but somewhat flexible pieces, of grayish or yellowish color, plastic above 140° F., soft at 212° F., insoluble in water or alcohol, soluble in chloroform, oil of turpentine, carbon disulphide, benzin and benzol. It contains a hydrocarbon, *Gutta*, $C_{10}H_{16}$ (80 per cent.), two resins named *Fluavil* and *Albau*, also a volatile oil, salts, fat and coloring matter.

Preparations of Gutta-percha.

Liquor Gutta-perchæ, *Solution of Gutta-percha* (Unofficial),—Gutta-percha 9, Carbonate of Lead 10, in Chloroform 91. Used as a protective application to eruptions and slight wounds, the evaporation of the menstruum leaving behind a thin adhesive and non-irritating pellicle.

Traumaticin (Unofficial),—is the name given to a 10 per cent. solution of Gutta-percha in Chloroform, which forms on drying a permanent, unirritating, adhesive, flexible and non-contractile skin for the treatment of skin affections and slight wounds. It forms an excellent basis for the application of Chrysarobin to psoriasis.

Gutta-percha has neither physiological action nor therapeutics, being used for its physical qualities alone. In surgical practice it has several applications, making a good material for splints, as it can be softened in hot water and adapted to any surface while pliable. From it are manufactured pessaries, specula, stethoscopes and other instruments. The solution may be used as a protective covering for excoriations and slight wounds, to prevent pitting in small-pox, and to paint over the line of suture after post-mortem examinations.

ELATERINUM, Elaterin, $C_{20}H_{28}O_5$,—is a neutral principle extracted from *Elaterium*, a substance deposited by the juice of the fruit of *Ecballium Elaterium*, or Squirting Cucumber, a cultivated European plant of the nat. ord. Cucurbitaceæ. Elaterium is no longer official by reason of its variable quality. Elaterin occurs in small, colorless scales or prisms, of bitter taste and neutral reaction, insoluble in water, soluble in 337 of alcohol and in solutions of the alkalies. Dose, gr. $\frac{1}{20}$–$\frac{1}{12}$.

Preparation.

Trituratio Elaterini, *Trituration of Elaterin*,—Elaterin 10, Sugar of Milk 90, thoroughly mixed by trituration. Dose, gr. ss–j.

Elaterin is the most powerful of the hydragogue cathartics, causing profuse, watery stools, and when given in large doses great prostration and gastro-intestinal irritation, nausea and vomiting. In the lower animals it does not produce purgation, but profoundly impresses the nervous system, causing irregular breathing, convulsions and death.

Its chief use is to produce free watery discharges in ascites, anasarca, uremia and cerebral disorders, but while the most efficient agent we possess for this purpose it must be used with great caution in the aged and feeble, as its action is very depressant.

ERGOTA, Ergot, *Ergot of Rye,*—is the sclerotium (compact mycelium or spawn, intermediate fibrous stage) of *Claviceps purpurea* (class Fungi), growing within the flower and replacing the grain of Rye, *Secale cereale* (nat. ord. Gramineæ). It occurs in fusiform, curved, grain-like bodies, of purplish-black color, peculiar, heavy odor, and oily, disagreeable taste. It should be only moderately dried, preserved in a close vessel, and have a few drops of chloroform dropped upon it from time to time, to prevent the development of insects. When more than one year old it is unfit for use. Dose, gr. x–ʒj.

Composition of Ergot.

The composition of Ergot and the nomenclature of its supposed constituents are subjects upon which there exist a great diversity of opinions, and about which there is nothing settled. The following synopsis gives the views of the different persons who have examined into the matter.

Wenzell (1864) named two alkaloids, *Ecboline* and *Ergotine*, which he claimed to be the active principles, and to be combined with *Ergotic Acid*, a volatile body yielding crystallizable salts. He also claimed the presence of Trimethylamine as a Phosphate.

Tanret (1877) isolated a crystallized alkaloid, which he named *Ergotinine* (dose, gr. $\frac{1}{60}$–$\frac{1}{10}$) ; also a volatile camphoraceous substance.

Dragendorf and his pupils (1875–1879) stated the active principles to be two in number, *Sclerotic* or *Sclerotinic Acid*, a very powerful body, yellow-brown, amorphous, tasteless and well adapted for hypodermic use in doses of gr. $\frac{1}{20}$–$\frac{1}{10}$, and *Scleromucin*, a colloid substance, also quite active. Besides these they found various coloring matters (Sclererythrin, Scleroxanthin, etc.), also a non-drying Oil, a peculiar sugar (Mykose), a number of alkaloids (Trimethylamine, etc.), and other inert principles.

Kobert (1885) announced that Ergot contains three active principles, (1) *Ergotinic Acid*, a glucoside, and the chief constituent of Sclerotinic Acid ; having no ecbolic action, but affecting the nervous system, the heart and the respiration ;—(2) *Sphacelinic Acid*, non-nitrogenous, unstable, soluble in alcohol, insoluble in water, stimulates the vaso-motor centre, and believed to be the active agent in contracting the blood-vessels and producing gangrenous ergotism ;—(3) *Cornutine*, an alkaloid, believed to be the agent which contracts the uterus. It produces convulsions and peristaltic contractions of the uterus, and is the active agent in convulsive ergotism.

Jacobj (1898) finds in Sphacelinic Acid a toxic resin named *Sphacelotoxin*, which differs from all other poisons in producing gangrene of various organs, especially in fowls and pigs. It induced abortion in pregnant animals and caused ataxia and other nervous symptoms in fowls.

Tanret's Ergotinine has been proved to have no action on the uterus. The Ergotin of Bonjean, Wiggers and Tanret is not a fixed compound, but a mixture. The Ecboline of Wiggers is also a mixture. Sclerotinic Acid is said by many authorities to act on the uterus, but this is positively denied by many others. It is probably a very uncertain preparation, and is said to be really a mixture of sphacelinic acid and cornutine. Ergot also contains *Trimethylamine*, to which its odor is due, a fixed oil, (30 per cent.) and Tannin. For the Ergotin of commerce see below.

Preparations.

Extractum Ergotæ Fluidum, *Fluid Extract of Ergot*,—prepared with Acetic Acid and Diluted Alcohol. Dose, ʒss-ij.

Extractum Ergotæ, *Extract of Ergot*, commonly called *Ergotin*,—is prepared by evaporating the fluid extract at a temperature not above 122° F., until reduced to a pilular consistence. Dose, gr. ij–xx.

Vinum Ergotæ, *Wine of Ergot*,—strength 15 per cent. Dose, ʒj–℥j. Is now made by an improved method and is more reliable than that formerly official.

Ergotin (Unofficial),—is the name of several watery extracts found on the market, and varying much in action both from each other and from the parent drug. That made by Squibb has about the same strength as the official extract, and represents the general powers of Ergot. It may be used hypodermically in doses of gr. ¼–gr. v. The Ergotin of Bonjean is also an aqueous extract, but is very variable in quality and frequently inert. Wiggers' Ergotin is insoluble in the ordinary menstrua, and inert on the vascular apparatus, but causes colic and gastro-enteritis.

PHYSIOLOGICAL ACTION.

Ergot is a motor-excitant and a vascular contractor, also hemostatic, anhidrotic, emmenagogue and oxytocic. It exalts the functional activity of the spinal cord; stimulates the vaso-motor centre, raising the blood-pressure; produces tetanic contraction of unstriped muscular fibre, diminishing the calibre of the arterioles; depresses the motor ganglia of the heart, causing a slower and weaker pulsation; is directly emmenagogue and oxytocic, and markedly increases intestinal peristalsis. Whether the admitted increase of blood-pressure is due to the action of the drug on the unstriped muscle of the arterioles or is indirectly caused by stimulation of the vaso-motor centre is a disputed question. Its action upon the circulation results in the production of an artificial anemia of the arterial system, and its phenomena are divided into two sets, named respectively *Acute* and *Chronic Ergotism*, according as the drug is administered in large doses or in small quantity for a considerable length of time.

Acute Ergotism. In large doses Ergot acts as a gastro-intestinal irritant, causing nausea and vomiting, gastralgia, colic, thirst, difficult micturition and purging. It slows the heart, raises the arterial tension greatly, dilates the pupils and produces pallor, vertigo and frontal headache. It stimulates the contraction of unstriped muscular fibre, especially affecting the sphincters and the uterus, causing continuous labor pains and tonic contraction of the sphincter vesicæ, making micturition difficult if not impossible. It also produces cerebral and spinal anemia, coldness of the surface, tetanic spasms and violent convulsions, but very large doses (several ounces) are necessary to cause such results. As much as ℥iij of the fluid extract has been given daily for a week or more, without producing any marked effect.

Chronic Ergotism occurs in two forms, the convulsive and the gangrenous,—either usually excluding the other. The convulsions are tetanoid spasms of the flexor muscles, the uterus, the intestinal fibres, and the muscles of respiration, ending in coma and death by asphyxia. The gangrenous form begins with coldness and numbness of the limbs, formication of the skin all over the body, loss of sensibility and abolishment of the special senses, bullæ of blood and ichor, followed by dry or moist gangrene of the lower extremities, buttocks and other parts, epileptiform convulsions, coma and death. Autopsies show changes in the posterior columns of the cord, resulting probably from spinal anemia.

Experiments with the various derivatives of Ergot show that no one of its constituents represents the power of the drug itself. Those which probably come nearest to it in action are the Ergotinine of Tanret and Sclerotinic Acid. Cornutine stimulates the central nervous system strongly and produces convulsions.

Analogues of Ergot are Ustilago (see under ZEA), Gossypii Radicis Cortex (Cotton-root Bark), and Caulophyllum (Blue Cohosh). They are each described under their respective titles.

Antagonists and Incompatibles.

Amyl Nitrite, Aconite, Veratrum Viride, Tobacco and Lobelia antagonize its action on the circulation. Caustic alkalies and metallic salts are chemically incompatible.

THERAPEUTICS.

Ergot has a wide field of application. Its most familiar use is to promote uterine contraction in labor, but as the contractions produced by it are continuous instead of the natural intermittent ones, it is highly dangerous when there is any obstacle in front of the child, the probable results being rupture of the uterus, paralysis of the fetal heart and severe laceration of the perineum. At the end of the second stage, when the head is born, is the best time for its use (if employed in labor at all) in order to promote firm uterine contraction, thereby guarding against post-partum hemorrhage and promoting the expulsion of the placenta. The tendency, however, of obstetrical teaching, is against its employment at all in labor; while in practice the teaspoonful of Ergot is almost invariably administered as soon as possible after the child is born. In many uterine affections, as chronic metritis, subinvolution, congestive dysmenorrhea, menorrhagia, fibroids and polypi, Ergot is well employed in producing firm contraction of the womb and promoting absorption of inflammatory products. It is extremely useful in amenorrhea due to plethora, and in the atonic form of spermatorrhea. In conjunctivitis, go[illegible] and inflammations of mucous membranes generally, it is [illegible] [illegible]efit, if used both locally and internally. It is also an ex[illegible] in acute and chronic dysentery, chronic diarrhea, ato[illegible] hemorrhages of arterial type, mania due to cerebral hyperemia, headache and migraine of congestive form, myelitis, spinal congestion, cerebro-spinal meningitis, splenic enlargement, lax sphincters of the rectum and bladder, and in incontinence of urine from paralysis of the sphincter vesicæ. Hemorrhoids are well treated by its local application, but in this affection it should not be used internally as it promotes venous congestion. In aneurism it aids coagulation by slowing the blood current, and in cardiac hypertrophy without valvular lesion it acts well by slowing the heart. In diabetes insipidus full doses of Ergot are often curative, and it has been used with benefit in diabetes mellitus.

Hypodermically, the aqueous extract dissolved in water and free from alcohol or any other irritating substance is in many cases much more prompt in action than when given internally, especially if injected near the seat of the affection. This is particularly true in post-partum and other hemorrhages, prolapse of the rectum, chronic metritis and subinvolution of the womb, uterine fibroids, varicocele and varicose veins. When so administered it will frequently contract the sphincter of the bladder so as to produce retention of urine and necessitate the use of the catheter.

ERIGERON, Fleabane (Unofficial),—is the flowering plant *Erigeron canadense*, a plant of the nat. ord. Compositæ, growing in N. America. It contains a Volatile Oil, which is official, also tannic acid and a bitter extractive.

Oleum Erigerontis, *Oil of Fleabane*,—a pale yellow liquid, of sp. gr. about 0.850, becoming darker by age and exposure to air, of peculiar and persistent odor, pungent taste and neutral reaction, readily soluble in alcohol. Dose, ♏x–ʒss.

Oil of Erigeron has the same action as Oil of Turpentine but is less irritant and less efficient. It has considerable reputation as a hemostatic, especially in menorrhagia and intestinal hemorrhage of passive form, as in typhoid fever. It is also used with benefit in diarrhea and dysentery, and in hemoptysis without fever or other evidence of irritation it is a very valuable remedy.

ERIODICTYON,—the leaves of *Eriodictyon glutinosum*, or Yerba Santa, a California shrub of the nat. ord. Hydrophyllaceæ. They contain an acrid Resin and an aromatic Volatile Oil.

Extractum Eriodictyi Fluidum, *Fluid Extract of Eriodictyon*,—Dose, ♏xv–ʒj.

Extractum Eriodictyi, *Extract of Eriodictyon* (Unofficial),—Dose, gr. ij–x.

Eriodictyon is expectorant, and covers the taste of Quinine in a remarkable manner, for which purpose it is combined in mixture with Glycyrrhizin, under the title *Velatine*, a proprietary preparation (see *ante*, page 276). It is used with fair success in bronchial and laryngeal affections, also in asthma. Combined in syrup with Grindelia it is very efficient for coughs.

EUCALYPTUS,—the leaves, collected from the older parts of the tree, of *Eucalyptus globulus* or Blue Gum-tree (nat. ord. Myrtaceæ), a native of Australia, now grown in California, Italy, etc. They contain tannic acid, a resin, a fatty acid and a *Volatile Oil*. The latter consists of three different oils which distil over at various temperatures, the first product being the official substance named *Eucalyptol*, $C_{10}H_{18}O$, which by the action of phosphoric acid is converted into *Eucalyptene*, a substance allied to Cymene, and *Eucalyptolen*.

Preparations.

Extractum Eucalypti Fluidum, *Fluid Extract of Eucalyptus*,—is three-fourths alcohol. Dose, ♏x–ʒj.

Oleum Eucalypti, *Oil of Eucalyptus*,—the volatile oil, is distilled from the fresh leaves of various species of Eucalyptus, that from *E. amygdalina* being considered wanting in Eucalyptol. Is soluble, in all proportions, in alcohol, carbon disulphide, or glacial acetic acid. Dose, ♏v–xxx, in emulsion or capsules.

Eucalyptol, $C_{10}H_{18}O$,—is a neutral body obtained from the volatile oil; a colorless liquid, of aromatic, camphoraceous odor, and pungent, cooling taste; soluble in all proportions in alcohol, carbon disulphide and glacial acetic acid. Dose, ♏iij–x.

PHYSIOLOGICAL ACTION.

The taste of Eucalyptus is warm, aromatic, bitter and camphoraceous. It increases the flow of saliva, the gastric juice and the intestinal secretions, and in small doses promotes appetite and digestion, increases the heart's action and lowers arterial tension. In large doses it produces eructations, indigestion, diarrhea, nausea and vomiting, lowered temperature, great muscular weakness, and if continued will irritate and congest the kidneys, and induce a feverish state with symptoms of cerebral congestion and great constitutional disturbance. In toxic doses it is a narcotic poison, and a fatal dose causes paralysis of respiration by direct action on the respiratory centre in the medulla.

Eucalyptus is powerfully antiseptic and destructive to low forms of life, a stimulating expectorant and an efficient diaphoretic. By some authorities it is believed to reduce the size of an enlarged spleen and to possess anti-malarial properties by absorbing noxious germs as well as by draining the soil of its water, and by its aseptic emanations purifying the atmosphere in its vicinity. It is largely cultivated in malarial districts for these properties, and is reported to have rendered habitable a portion of the deadly Roman Campagna.

Eucalyptus is eliminated by the skin, the bronchial mucous membrane and the kidneys. It imparts its odor to the breath and the urine and is more or less irritant at the points of its elimination.

THERAPEUTICS.

Eucalyptus is an efficient stomachic in atonic dyspepsia, chronic gastric and intestinal catarrh, and in conditions of the intestinal canal which favor the development of worms. In chronic catarrhal conditions of the genito-urinary organs, the broncho-pulmonary mucous membrane and
dder, it is very useful, acting as a stimulant and disinfec-
membranes. It is equally beneficial in chronic bron-
rrhea, in cachectic states generally and in convales-

cence from acute diseases. In epidemic influenza (grippe) the oil has been used internally with good results, and sprinkled on blotting-paper placed in offices and stores has seemed to act as a prophylactic on persons employed therein. In hysteria, chorea and asthma it is beneficial, in the latter affection being advantageously smoked in cigarettes with Stramonium or Belladonna leaves. In malaria as a reconstructant it is better than Quinine, and it has considerable utility in obstinate intermittents where it is desirable to stop the use of Cinchona preparations. As an antiseptic it is highly valuable in dilute solution for application to ulcers and as a substitute for Carbolic Acid on gauze in the antiseptic treatment of wounds. It is also used in dilute solution locally, as a stimulating disinfectant in stomatitis, and in the subacute stages of pharyngitis and tonsillitis. An aqueous preparation is highly recommended as a vehicle for alkaloids in solution for hypodermic use, to prevent the development of the penicillium which rapidly destroys the alkaloid present.

EUONYMUS, Wahoo,—is the bark of *Euonymus atropurpureus*, a shrub of the nat. ord. Celastrineæ, growing in the U. S. It contains an amorphous, bitter principle named *Euonymin*, also Resins, *Euonic Acid*, and *Asparagin*, fixed oil, etc.

Extractum Euonymi, *Extract of Euonymus*,—Dose, gr. j–v.

Euonymin (Unofficial),—the eclectic preparation, consists of the fixed oil and resin, and is given in doses of gr. ss–v.

Euonymus is classed with Rhubarb, Jalap, Aloes, etc., as a tonic-astringent and resin-bearing purgative. It is said to be also diuretic and expectorant and a very efficient cholagogue. Its cathartic action is similar to that of Rhubarb, but milder. It has been employed with benefit in some cases of dropsy, also in habitual constipation, torpid liver, and pulmonary affections. In overdoses it will set up considerable gastro-intestinal irritation.

EUPATORIUM, Thorough-wort, *Boneset*,—the leaves and flowering tops of *Eupatorium perfoliatum*, an American plant of the nat. ord. Compositæ. It contains a neutral, bitter principle, named *Eupatorin*, tannic acid, a volatile oil, etc.

Extractum Eupatorii Fluidum, *Fluid Extract of Eupatorium*,—Dose, ♏x–ʒj.

Eupatorium is a bitter tonic and efficient diaphoretic, also in full doses emetic and aperient. It has been supposed to have antiperiodic and teniafuge powers. A warm infusion (Boneset tea) is a popular diaphoretic in remittent and typhoid fevers, also at the onset of an attack of acute catarrh or general cold. As a bitter tonic it may be used with advantage in dyspepsia and general debility. Its common name is derived from its supposed power to relieve the bone pains of dengue, the "break-bone fever."

Another variety of Eupatorium, *E. purpureum*, or Gravel-root, is reputed to have decided power over the uric acid diathesis.

EUPHRASIA, Eye-bright (Unofficial),—is a plant of the nat. ord. Strophulariaceæ, growing in Europe and the U. S., containing *Euphrastic Acid*, tannin, etc. It was formerly of great repute in various eye-affections, and may be of utility as a mild astringent in catarrhal conjunctivitis. Its chief value, however, is to abort an attack of acute nasal catarrh with lachrymation, for which purpose a few drops of the tincture every two hours is remarkably efficient. In hay-fever also it is of decided utility in mitigating the catarrhal symptoms, and in the acute coryza of measles it will be found an excellent remedy. A tincture (1 to 9) of the fresh plant should be used, and given in doses of ♏j–v.

efflorescent, of saline, styptic taste, and acid reaction, soluble in 1.8 of water at 59° F., insoluble in alcohol. Is chiefly used to make the Dried Sulphate and other preparations.

Ferri Sulphas Exsiccatus, *Dried Ferrous Sulphate,* $2FeSO_4 + 3H_2O$,—a grayish-white powder, nearly soluble in water, consisting of the preceding salt, heated gradually until it ceases to lose weight. The most astringent and irritating ferrous salt, but an excellent one in small doses. Dose, gr. ss–ij, in pill.

Ferri Sulphas Granulatus, *Granulated Ferrous Sulphate,*—is the same salt as above, precipitated by alcohol from solution in dilute sulphuric acid. Dose, gr. ss–ij.

Liquor Ferri Subsulphatis, *Solution of Ferric Subsulphate, Monsel's Solution,*—is an aqueous solution of Basic Ferric Sulphate, containing 43.7 per cent. of the salt. A dark, reddish-brown, almost syrupy liquid, of very astringent but not caustic taste, and acid reaction, mixing with water or alcohol in all proportions without decomposition. Is but slightly irritating and powerfully astringent, chiefly used locally as an astringent and hemostatic, but may be given internally in doses of ♏iij–x, well diluted.

Liquor Ferri Tersulphatis, *Solution of Ferric Sulphate,*—is an aqueous solution of Normal Ferric Sulphate, $Fe_2(SO_4)_3$, containing 28.7 per cent. of the salt. Has the same properties as described for the preceding. Used to make other preparations of Iron.

Ferri Valerianas, *Ferric Valerianate,* $Fe_2(C_5H_9O_2)_6$,—a dark, tile-red, amorphous powder, of faint, valerianic odor, and mildly styptic taste, insoluble in cold water, decomposed by hot water, readily soluble in alcohol. Dose, gr. j–iij, in pill.

Compound Iron Salts and their Preparations.

Liquor Ferri et Ammonii Acetatis, *Solution of Iron and Ammonium Acetate, Basham's Mixture,*—prepared from Tincture of Ferric Chloride 2, Diluted Acetic Acid 3, Solution of Ammonium Acetate 20, Aromatic Elixir 10, Glycerin 12, Water to 100. An excellent and very pleasant preparation, having some diuretic and diaphoretic powers. Dose, ʒij–v, well diluted.

Ferri et Ammonii Citras, *Iron and Ammonium Citrate,*—prepared from Solution of Ferric Citrate 10, Ammonia Water 4, mixed and evaporated. Transparent, garnet-red scales, deliquescent, readily soluble in water, insoluble in alcohol. Dose, gr. ij–v.

Ferri et Ammonii Sulphas, *Ferric Ammonium Sulphate, Ammonio-ferric Alum,*—pale, violet crystals, efflorescent, of styptic taste and slightly acid reaction, soluble in 3 of water, insoluble in alcohol. Is the least astringent of the sulphates of iron, but more so than any of the salts formed by vegetable acids. Dose, gr. iij–xv.

Ferri et Ammonii Tartras, *Iron and Ammonium Tartrate, Ammonio-ferric Tartrate,*—transparent, reddish-brown scales, slightly deliquescent, of sweetish and slightly ferruginous taste, very soluble in water, insoluble in alcohol. Contains an equivalent of about 25 per cent. of Ferric Oxide, and has but slight irritant qualities. Dose, gr. v–xx.

Ferri et Potassii Tartras, *Potassio-ferric Tartrate,*—transparent, garnet-red scales, slightly deliquescent, of sweetish and slightly ferruginous taste, very soluble in water, insoluble in alcohol. Is the least disagreeable in taste of all the iron preparations, and but slightly astringent and not constipating. Dose, gr. v–x.

Ferri et Quininæ Citras, *Iron and Quinine Citrate,*—prepared from Ferric Citrate 85, Quinine, dried, 12, Citric Acid 3, Aq. Destil. q. s. ad 100, mixed and evaporated. Thin, transparent, yellowish-brown scales, slowly deliquescent, of bitter taste, slowly soluble in water, slightly soluble in alcohol. Contains 11½ per cent. of dry quinine. Action, astringent and stimulant to the digestive tract. Dose, gr. iij–v.

Ferri et Quininæ Citras Solubilis, *Soluble Iron and Quinine Citrate,*—Ferric Citrate 85, Quinine, dried, 12, Citric Acid 3, Ammonia Water, Distilled Water, to 100. Thin, transparent scales, of greenish, golden-yellow color, rapidly soluble in cold water, partially soluble in alcohol. Dose, gr. iij–v.

Vinum Ferri Amarum, *Bitter Wine of Iron,*—has of the preceding 5 parts, Tinct. Aurantii Dulcis 15, Syrup 30, White Wine to 100. Dose, ʒj–iv.

Ferri et Strychninæ Citras, *Iron and Strychnine Citrate,*—Ferri et Ammonii Citras 8, Strychninæ 1, Ac. Citric. 1, Aq. Destil. 120, mixed and evaporated. Transparent, garnet-red scales, deliquescent, readily soluble in water, slightly so in alcohol. Contains per cent. of Strychnine. Action,—astringent and stimulating. Dose, gr. j–iij.

Syrupus Ferri, Quininæ et Strychninæ Phosphatum, *Syrup of the Phosphates of Iron, Quinine and Strychnine.* [Described under PHOSPHORUS.]

Syrupus Hypophosphitum cum Ferro, *Syrup of Hypophosphites with Iron.* [Described under PHOSPHORUS.]

Unofficial Preparations of Iron.

Ferratin, *Acid Albuminate of Iron,*—is a patented preparation, claimed to be the characteristic iron compound of the liver, but this is denied by competent authority. It is artificially prepared from albumin, is insoluble in water and dilute acids, but is soluble in water having a slight alkaline reaction. It causes no digestive disturbance, and has given good results in anemia, chlorosis, and allied affections. Dose, gr. jss–viij.

Ferri Albuminas, *Iron Albuminate,*—a cinnamon-brown powder, soluble in water acidulated slightly with HCl. Dose, gr. x–xxx, in simple aqueous solution, or in pill.

Ferri Arsenas, *Ferrous Arsenate,* $Fe_3As_2O_8$,—a green, tasteless powder, insoluble in water, soluble in HCl. Its activity is due to the arsenic alone. Dose, gr. $\frac{1}{10}$–$\frac{1}{6}$.

Ferri Bromidum, *Ferrous Bromide,* $FeBr_2 + 3H_2O$,—a yellow salt, of styptic taste, unstable, deliquescent and very soluble. A syrup is official in the Br. Ph. which has about 4½ grains of the bromide in each fluid-drachm. Dose of the syrup, ʒ ss–j.

Ferrum Dialysatum, *Dialyzed Iron,*—composition varies from $Fe_2Cl_6 + 12Fe_2O_3$ to $Fe_2Cl_6 + 95Fe_2O_3$, and is a 10 per cent. solution of Ferric Oxychloride in water. Prepared by treating a solution of Chloride of Iron with Ammonia, ferric hydrate being precipitated, this being dissolved by agitation is placed in a dialyzer and suspended in water, which is renewed as long as it shows a trace of HCl. A reddish-brown liquid, free from astringent, styptic taste, but a very feeble chalybeate. Is used as a chalybeate, and as an antidote to Arsenic, but is not considered an eligible preparation. Dose, ♏x–xxx.

Ferri Malas, *Ferrous Malate,*—is a combination of the juice of sour apples and powdered iron, much esteemed in Germany, where it is official and is given in tincture, *Tinctura Ferri Pomatum* (Ph. Ger.), the dose of which is ♏xv–xxx.

Syrupus Ferri et Manganesii Iodidi, *Syrup of Iron and Manganese Iodide,*—is a pale, straw-colored liquid, containing a little sulphate of potassium, and in each fluid ℥ has 50 grains of the mixed iodides in the proportion of Iron Iodide 3 parts to 1 of Manganese Iodide. Dose, ♏x–xxx–ʒj.

Syrupus Ferri et Manganesii Phosphatis, *Syrup of Iron and Manganese Phosphate,*—as used by Dr. Simpson, of Edinburgh, contains in each ʒ of syrup 2 grains of Iron Phosphate and 1 grain of Manganese Phosphate. Dose, ʒj.

Mistura Ferri Aromatica, *Aromatic Iron Mixture,*—Pale Bark 4, Calumba 2, Cloves 1, Iron Wire 2, Tr. Cardamomi Co. 12, Tr. Aurantii Cort. 2, Aq. Menth. Pip. 50. Macerate the first 4 in the last one for 3 days, filter, add the tinctures and make up to 50 parts. Dose, ℥j–ij.

Mistura Ferri Laxans, *Laxative Iron Mixture,*—Ferri Sulph. gr. ij, Magnesii Sulph. ʒj, Ac. Sulph. Dil. ♏iij, Spt. Chlorof. ♏xx, Aq. Menth. Pip. ad ℥j. Dose, ℥j.

Mistura Ferro-salina, *Ferro-saline Mixture,*—Magnesii Sulph. ℥j, Potassii Bitart. ʒj, Ferri Sulph. Exsic. gr. x, Aquæ quart j. Dose, a wineglassful.

Notes on the Preparations.

The blandest iron preparations are those which are insoluble or but sparingly soluble in water; as—metallic iron, ferrous carbonate, ferric hydroxide, ferric hypophosphite and ferric valerianate. Of the aqueously soluble compounds, those which are salts of the vegetable acids, and the mixed salts ferric phosphate and ferric pyrophosphate, are more or less bland, especially the citrate, the tartrate and the phosphate, which are purely bland, the acetate and lactate comparatively so. The salts of the strong mineral acids are irritant and astringent or styptic in varying degree; the iodide and bromide being irritant but not very astringent, ferrous sulphate and the ammonio-ferric sulphate being powerfully astringent but not styptic, and ferric chloride, ferric nitrate and both ferric sulphates being powerfully astringent and styptic. In overdoses the astringent salts are irritant poisons and may produce fatal results if in sufficient volume and concentration of solution. The per-salts (ferric) are the most actively irritant. The ferrous salts are the most readily absorbed and tolerated, are less irritant and astringent than the ferric salts, and are the most suitable ones for prolonged administration.

The Oxides and *Carbonates* possess the hematinic action of iron with but slight astringency, and are therefore employed to restore the quality of the blood in cases of anemia, chlorosis and amenorrhea with tendency to dyspepsia and constipation. *Ferrum Reductum* is one of the best preparations for internal use, but it causes sulphuretted or phosphoretted eructations which are disagreeable. *The Subcarbonate* is little more than the red oxide, but in the massa ferri carbonatis oxidation is prevented by the sugar. *The Hydrated Oxide* is used only as an antidote in arsenical poisoning.

The Vegetable Acid Salts are the least irritant to the stomach, but are also the least efficient as chalybeates. They may be administered in white wines, or with alkalies and vegetable acids in effervescent mixtures. *The Mineral Acid Salts* are characterized by their astringent and corrugating action on the tissues, and are used locally as hemostatics, the solution of the subsulphate being preferred for topical use as it is powerfully styptic but not corrosive. The pyrophosphate is easily assimilated, readily soluble and devoid of irritant qualities. The tincture of the chloride is one of the most efficient preparations for internal use, and is most agreeable in the form of Creuse's tasteless solution (see *ante*, p. 316). *Other Compounds* contain iron in combination with other active agents, as the preparations of the iodide and bromide, those with quinine, strychnine, etc. These preparations are generally used for a twofold purpose, namely—to relieve anemia and to act upon the specific ailment upon which the anemia depends. *The Albuminate* contains 5 per cent. of ferric oxide and is considered by many practitioners to be the most readily assimilated of all the iron preparations.

PHYSIOLOGICAL ACTION.

Metallic Iron is not inert, for in the stomach it acquires molecular activity through its oxidation. It is a normal constituent of the blood (1 part to 230 of red corpuscles), and is also found in the bile, lymph, chyle, gastric juice, in the pigment of the eye, in the milk and in the urine. Occurring in the blood, the tissues generally and many of the healthy secretions, also in most of the foods upon which the body is nourished, it may be considered a food rather than a medicine, though it has many medicinal uses. Administered internally in small doses it acts as a stomachic and general tonic, promotes appetite and digestion and improves the quality of the blood, increasing the number of the red corpuscles.

In large doses or in small ones long continued it is directly unfavorable to digestion, nausea and vomiting being caused by the soluble preparations. Its per-salts are actively irritant, and some, as the iodide, chloride, nitrate and sulphate, are active poisons, highly astringent to the tissues and very injurious to the teeth. Locally the iron salts of the mineral acids are more or less constringent and irritant to the mucous membranes and the tissues, acting as astringents and hemostatics by virtue of their power to coagulate albumin. The tincture of the chloride is considered diuretic.

Absorbable iron preparations administered to a healthy person, or for a long time in disease, exert but little influence, giving rise to but few and slight clinical symptoms. A sense of tension and fulness of the head, dull pains, discomfort, also a hard and quickened pulse, constitute usually the only obvious derangement. When given, however, to a person suffering from anemia or chlorosis the morbid symptoms expressive of deficient hemoglobin generally subside and the patient soon improves in health and strength. The action of iron is to cause an increase of the hemoglobin of the red blood corpuscles, either by its direct conversion into an ingredient of hemoglobin, or by stimulating the functional activity of the hematopoietic organs, or perhaps by both means combined. This power of enriching the red blood corpuscles in hemoglobin is essentially the whole constitutional action of iron. About 40 to 50 grains are estimated to be present in the tissues of a healthy adult, but only about $\frac{1}{12}$ to $\frac{1}{6}$ of a grain is daily supplied by the ordinary dietary. This amount of intake is sufficient to preserve the iron equilibrium, about the same quantity being excreted daily, chiefly in the feces and to a slight extent in the urine.

In the stomach all iron preparations are changed to the chloride by the HCl of the gastric juice, and in the duodenum to an alkaline albuminate. The greater portion is carried on through the intestinal canal, where it is converted into a sulphide, which blackens the feces; a part, however, being absorbed by the intestinal epithelium in solid form and perhaps in solution. After reaching the blood by way of the lymph channels, this small quantity of absorbed iron is deposited in the spleen, where it may undergo some changes, is again taken up by the blood and deposited in the liver and perhaps in the bone marrow. In the liver the originally inorganic iron is converted into higher forms and eventually into hemoglobin, ferratin being probably one step in the series. When there is no deficiency of iron in the system the liver slowly yields its store to the blood again, to be carried to the cecum and large intestine, by the epithelium of which it is finally excreted.

The doctrine of Kletzinsky, Bunge and others, concerning the non-absorption of iron, though often shown to be erroneous, is occasionally resuscitated by writers and teachers of medicine. Briefly stated, this doctrine is as follows: That the iron existing in food-stuffs as a constituent of nucleo-albumin is the only source of iron supply to the system for the formation of hemoglobin. That no iron compound administered by the stomach is absorbed, but after conversion to a chloride by the gastric juice the only function of iron so administered is to chemically satisfy the hydrogen sulphide and other sulphur compounds in the intestinal canal, thereby protecting the ingested food-iron from attack by these sulphur compounds and permitting it to enter the system. Against this theory have been urged the facts that no metal replaces iron in the treatment of chlorosis, though others would similarly satisfy the sulphur compounds; that iron is curative in chlorosis when injected hypodermically, and that the sulphide administered so as to reach the intestines unchanged acts as well as other iron preparations. Furthermore, it has been shown that ordinary preparations of iron given internally are absorbed; also that anemia is not necessarily accompanied by intestinal putrefaction; while it has never been demonstrated that hydrogen sulphide is invariably present in the intestinal canal of chlorotic subjects.

Incompatibles.

Alkalies and their carbonates, *Acids*, acidulous salts, and vegetable *Astringents* are incompatible with most preparations of Iron, the latter group being so by virtue of their Tannic and Gallic Acids, which form a deep blue-black precipitate (tannate of iron) with the per-salts. The Tincture of the Chloride is decomposed by alkalies, alkaline earths and their carbonates, astringent vegetable infusions, and by mucilage of acacia, the latter producing therewith a brown, semi-transparent jelly.

THERAPEUTICS.

The chief indication for the internal administration of Iron is anemia, when plethora, hemorrhage or fever exist it is contraindicated. It should always be given after meals, and occasionally suspended for a time, to avoid deranging the stomach. It is generally considered useless to prescribe iron in any form until after constipation has been relieved and a regular action of the bowels established. When the appetite and digestion are improved by Iron it will do the greatest amount of good, many authorities holding that the principal benefit derived from its use, even in anemia, is due to its stimulating action upon digestion and the primary assimilation. The Sulphate is one of the most efficient salts and is well ed in combination with Aloes when any intestinal torpor exists, espe-
y as it increases the cathartic power of the latter drug, economizing

it, and conferring upon it a permanence of action, which alone it does not possess. In chlorosis, pseudo-leucocythemia, chorea of anemic girls at the age of puberty, epilepsy and neuralgia of the anemic, amenorrhea and other menstrual disorders of the same class of subjects, and in acute rheumatism of pale, cachectic persons, the chalybeates are generally very efficient remedies, especially the Tincture of the Chloride. The same preparation is extensively employed in erysipelas and diphtheria with good results, and in albuminuria with chronic disease of the kidneys it is a useful chalybeate diuretic. In many cardiac diseases of the anemic, fatty heart, weak heart, dilatation, mitral disease, etc., ferruginous preparations are often of signal advantage. In the syphilitic cachexia, chancroid, and sloughing phagedena, the Iodide gives good results, particularly when the subject is one of debilitated constitution. In the nocturnal incontinence of children the Syrup of the Iodide is one of the most efficient remedies. In all chronic affections of the respiratory organs, when hemorrhage is not existing or threatened, the Iron, Quinine and Strychnine Phosphate is used with much benefit. In passive hemorrhages, especially when due to anemia, the Tincture of the Chloride is very effective, and in all active bleeding the Solution of the Subsulphate locally used is a prompt and efficient hemostatic. A weak solution of the latter preparation (ʒj ad ℥viij), used in the form of spray, is the most serviceable astringent in obstinate epistaxis, and in hematemesis the same solution may be swallowed in small quantities at short intervals. In chronic diarrhea and dysentery the Solution of the Nitrate is an efficient astringent, and a weak solution of the Chloride is used as a rectal injection in tropical dysentery and against thread-worms. The Sulphate is much employed as a cheap disinfectant for sewage, its action being to precipitate the proteids, which carry down the bacteria mechanically. The Hydrated Oxide is the most effective antidote in arsenical poisoning, as it forms with arsenous acid an almost insoluble compound. The solutions used in its preparations should be kept on hand and mixed only when wanted for use.

FICUS, Fig,—is the fleshy receptacle of *Ficus Carica*, bearing fruit upon its inner surface. The fig-tree is a member of the nat. ord. Urticaceæ and a native of the shores of the Levant, but is cultivated in Southern Europe and in other warm countries. Figs contain about 62 per cent. of grape sugar, also gum, fat, etc., and are a constituent of the official Confectio Senna.

Figs are demulcent, laxative and nutritious. They are used in their fresh state as an aliment, but if eaten in quantity may produce flatulence, enteralgia and diarrhea. They are chiefly used as an article of diet in habitual constipation, but may be employed as an ingredient of demulcent decoctions, and locally as a poultice to gum-boils.

FŒNICULUM, Fennel,—is the fruit of *Fœniculum capillaceum*, a European cultivated plant of the nat. ord. Umbelliferæ. It contains a volatile oil, united with a terpene, and is a constituent of Pulvis Glycyrrhizæ Compositus.

Oleum Fœniculi, *Oil of Fennel,*—the volatile oil, a light yellow-colored liquid, having the odor of fennel, a warm taste and neutral reaction, soluble in alcohol. It is an ingredient of Spiritus Juniperi Compositus. Dose, ♏ij–v.

Aqua Fœniculi, *Fennel Water,*—contains 2 parts of the oil in 1000 of distilled water. Dose, ʒss–℥j.

Fennel is an aromatic stomachic and a mild stimulant. It is chiefly used as an agreeable carminative in flatulence and colic, and as a corrigent to Senna, Rhubarb, and other disagreeable medicines. An infusion is often used as an enema to expel flatus in infants.

FORMALIN (Unofficial),—is the proprietary name given by its patentees to a 40 per cent. aqueous solution of *Formic Aldehyde* or *Formaldehyde* (see *ante*, page 130), which solution has heretofore been used mainly as a preservative of meat and in histological work as a fixing agent. It is one of the most powerful germicides, equal if not superior to corrosive sublimate and practically non-toxic in the strength employed. It is also a most energetic disinfectant, and sprayed over floors and walls or dropped on hot plates or sheets of metal, will disinfect a room more effectually than any other agent. As a deodorant it is equally efficient, completely destroying the peculiar methyl-mercaptan odor of the feces, and entirely deodorizing sulphuretted hydrogen. It is rapidly becoming the favorite surgical antiseptic. It mixes with water in all proportions, so that any dilution required can be easily prepared. To make a 1 per cent. solution one part of Formalin is added to forty parts of water (1 oz. to 2½ pints), it being itself a 40 per cent. solution. Solutions of 1 per cent. strength are sufficiently strong for most purposes, and when sprayed above the patient's head by a steam-atomizer for 20 minutes thrice daily have proved highly efficient in whooping-cough and chronic bronchitis. Weaker solutions (½ per cent.) are used as gargles and mouthwashes and for the irrigation of cavities, and stronger ones (2½ per cent.) for psoriasis, lupus and other skin diseases. Solutions of 1 part in 2,000 or 3,000 are highly recommended by Dr. Davidson for local application in the septic abrasions of the cornea ending in hypopyon ulcers, which form so large a part of ophthalmological work in manufacturing communities. Formalin has a tannin-like effect upon the skin, producing a leathery condition which passes into that of a localized necrosis without suppuration, leaving the surface with the appearance of a newly-healed superficial wound. It has marked toxic properties when inhaled in quantity, and the vapor is very irritating to the eyes and the throat. *Amyloform*, *Dextroform* and *Glutol*, are compounds of Formaldehyde with starch, dextrin and gelatin respectively, and have been used as antiseptic dressings.

FRANGULA, Buckthorn,—the bark, collected at least one year before being used, of *Rhamnus Frangula*, or Alder Buckthorn, a European shrub of the nat. ord. Rhamneæ. ntains several principles, of which the only important one is *Frangulin*, or *Rhamno-hin*, a lemon-yellow, odorless and tasteless glucoside, insoluble in water and but ngly so in alcohol or ether, and thought to be identical with Cathartin, the active principle of Senna. Another species of the genus Rhamnus is described under the title RHAMNUS PURSHIANA.

Extractum Frangulæ Fluidum, *Fluid Extract of Frangula.*—Dose, ʒ ss–ij.

Frangula-bark when fresh is a violent irritant to the gastro-intestinal tract, producing vomiting, purging, and much pain. The old dried bark is a safe purgative without irritant qualities, and is much used in the constipation of pregnancy, and other conditions requiring purgation. The fluid extract is the best form for administration.

FUCHSIN, Roseïne, *Magenta, Anilin Red* (Unofficial),—is the Hydrochlorate of Rosanilin, $C_{20}H_{10}N_3+HCl$, occurring in brilliant, elongated crystals having a green lustre, readily soluble in water and therewith making a bright red solution. Given internally it has produced salivation, vomiting, and diarrhea; and when injected intravenously it has caused trembling, staggering, albuminuria and fatty degeneration of the kidneys, symptoms which are thought to be possibly due to the presence of Arsenic or Anilin as impurities. It imparts a magenta color to the urine, and is excreted by the kidneys, liver and salivary glands. It has been found to be very efficient in reducing albuminuria, in many instances having entirely arrested it. It is best administered in pill with a vegetable extract as Liquorice or Gentian, and in doses of gr. ½–iv, according to age.

FUCUS VESICULOSUS, Bladder-wrack, *Sea-wrack* (Unofficial),—is a perennial plant of the nat. ord. Algæ, growing on the shores of the Atlantic and Pacific Oceans as a sea-weed. It has a flat leaf, with a midrib throughout its length, and small spherical vesicles, filled with air, in the leaf. It contains mucilage and much Soda in saline combination, also Iodine, but less of the latter than other algæ growing in deeper water. A decoction of the fresh plant is the best form for administration.

Fucus Vesiculosus is one of a number of marine plants which are used in various parts of the world as food for man and cattle and as manure. The species under consideration is considered alterative and tonic, and has been employed in goitre, glandular and joint enlargements and psoriasis, but especially to produce absorption of adipose tissue in the obese. An extract is sold under the title "Anti-fat."

GALBANUM (Unofficial),—is a gum-resin obtained from *Ferula galbaniflua*, an Asiatic plant of the nat. ord. Umbelliferæ, and probably from other allied plants. It occurs in minute tears, agglutinated into a hard mass, of balsamic odor and acrid, bitter taste. It contains a *Volatile Oil* isomeric with Turpentine, a Gum, and a mixture of Resins which yield by dry distillation a blue oil and *Umbelliferon*, a tasteless substance in satiny crystals. Dose, gr. x–xx, in pill or emulsion.

Galbanum is stimulant, expectorant and antispasmodic, acting much like Ammonia and Asafetida, and usually given with either of these substances. It is used in chronic bronchitis and catarrh of mucous membranes generally, in amenorrhea and chronic rheumatism.

GALLA, Nutgall,—is an excrescence on *Quercus lusitanica*, the Dyer's Oak, a shrub of the nat. ord. Cupuliferæ, growing in Western Asia, and is caused by the puncture and deposited ova of the insect *Cynips Gallæ tinctoriæ*. Galls are hard, globular bodies, of blackish-gray color, tuberculated on the surface, having a central cavity and an intensely astringent taste. They contain from 15 to 75 per cent. of *Tannic Acid*, about 5 per cent. of *Gallic Acid*, and other unimportant constituents. Dose, gr. v–xv.

Tinctura Gallæ, *Tincture of Nutgall*,—strength 20 per cent. Dose, ʒ ss–iij.

Unguentum Gallæ, *Nutgall Ointment*,—strength 10 per cent.

The action of Nutgalls is powerfully astringent, due to the Tannic and Gallic Acids contained in them. Having no special action or use of their own, their qualities may be learned by consulting the articles ACIDUM TANNICUM and ACIDUM GALLICUM.

GAULTHERIA, Wintergreen (Unofficial),—is the leaf of *Gaultheria procumbens*, an American evergreen plant of the nat. ord. Ericaceæ. Its active principle is the *Volatile Oil*, which is official. It also contains Tannic Acid, Arbutin, Ursone, Ericolin, etc.

Oleum Gaultheriæ, *Oil of Wintergreen*,—is the volatile oil, a liquid of peculiar and aromatic odor, sweetish, warm taste, and a slightly acid reaction. It is readily soluble in alcohol, and consists of *Methyl Salicylate* 90 per cent., and *Gaultherilene*, a hydrocarbon, 10 per cent. Dose, ♏iij–x. It is nearly identical with the Volatile Oil of Betula.

Spiritus Gaultheriæ, *Spirit of Gaultheria*,—has of the oil 5 per cent., dissolved in 95 of alcohol. Used for flavoring. Dose, ʒss–ij.

Gaultheria is stimulant and slightly astringent. Its chief value is as one of the sources of the oil named after it, which is also found in the sweet birch and many other plants, and, containing so large a proportion of Methyl Salicylate or Methylsalicylic Acid, is powerfully antiseptic and antipyretic. In large doses it is irritant to the stomach, in one case ℥j having caused death by violent gastritis.

Oil of Gaultheria is used successfully as a substitute for Salicylic Acid in many conditions, especially in rheumatic and gouty disorders. The plant has been used as an emmenagogue and a galactagogue, but its principal employment is in the form of the spirit as an agreeable flavoring agent.

GELSEMIUM, Gelsemium, *Yellow Jasmine*,—is the rhizome and roots of *Gelsemium sempervirens*, a climbing plant of the nat. ord. Loganiaceæ, with showy yellow flowers, which grows in the forests of the southern U. S., forming festoons from one tree to another. It contains a volatile oil, a resin and an alkaloid, *Gelsemine*, in combination with *Gelsemic Acid*. Dose, gr. ij–xx.

Preparations.

Extractum Gelsemii Fluidum, *Fluid Extract of Gelsemium*.—Dose, ♏ij–xx.

Tinctura Gelsemii, *Tincture of Gelsemium*,—strength 15 per cent. Dose, ♏x–ʒj.

Gelsemina, *Gelsemine*, $C_{11}H_{19}NO_2$ (Unofficial),—an amorphous, colorless, inodorous, nearly insoluble solid, of intensely bitter taste, and strong basic properties, neutralizing the strongest acids, and with them forming soluble salts. Dose, gr. $\frac{1}{60}$–$\frac{1}{20}$.

PHYSIOLOGICAL ACTION.

Gelsemium is a powerful motor-depressant, causing paralysis of motility and depression of sensibility by central action on the spinal cord. It is also antispasmodic and diaphoretic. In moderate doses it produces languor, slowing of the cardiac rate, enfeebled muscular action, impaired sensibility, drooped eyelids and dilated pupils, with some diaphoresis. In toxic dose, as a teaspoonful of the fluid extract, it produces vertigo, diplopia, drooped eyelids and dilated pupils (paralysis of 3d nerve), labored respiration, slow and feeble heart, dropped jaw, staggering gait, extreme muscular weakness and almost complete anesthesia, profuse diaphoresis, loss of articulation, and death by asphyxia from paralysis of the muscles of respiration, consciousness being preserved until CO_2 narcosis sets in. Convulsions, with backward movements, occur in animals but not in man. Motion is affected before sensibility in warm-blooded animals, sensibility before motion in frogs.

Gelsemium is not an arterial depressant, although it lowers the heart-rate, and is not irritant to the gastro-intestinal tract, but it produces a decided lowering of the body-temperature. The effects of a moderate dose pass off in about three hours.

Antagonists and Incompatibles.

Morphine is the most complete antagonist, so are also Digitalis, Ammonia, Alcohol, and to some extent the tincture of Xanthoxylum fraxineum. Emetics, heat, faradization of the respiratory muscles and artificial respiration are measures of prime importance. The caustic Alkalies and Tannic Acid are chemically incompatible.

THERAPEUTICS.

Gelsemium is indicated in all conditions of exalted nerve function, and contra-indicated whenever there is a weak heart. It is best used in cerebro-spinal meningitis, mania with great motor excitement and persistent insomnia, delirium tremens, many forms of sleeplessness, pneumonia and pleurisy if the heart be strong, coughs of convulsive and spasmodic character, neuralgia of the fifth nerve, remittent fever, after-pains, ovarian neuralgia, dysmenorrhea, irritable bladder of women, and incontinence of urine from spasm of the vesical muscular fibres. In most of these affections the remedy must be pushed to the inducing of some physiological symptoms, but its action should not be carried beyond the production of drooped eyelids, diplopia and muscular debility. It has been used with varying success in intercostal neuralgia, myalgia, sciatica, spasmodic asthma, sick headache, eczema, pruritus and tetanus. Its especial field, however, is in remittent and typho-malarial fevers and cerebro-spinal meningitis. It is not suitable to low fevers and has not sufficient power as a cardiac depressant to be of much use in sthenic forms.

There is much evidence for the claim, made for the alkaloid Gelsemine, of singular efficiency in antagonizing the mental condition occasionally manifested by an unusual degree of dread, in regard to some approaching ordeal, or ordinary trial of life; as, for example, that of a woman concerning her impending confinement, or of a student in reference to his examinations. In very many such cases, the use of Gelsemine, in small doses frequently repeated (gr. $\frac{1}{100}$ ter die), has seemed to remove the state of abnormal fear entirely.

GENTIANA, Gentian,—is the root of *Gentiana lutea*, the Yellow Gentian, one of a numerous family of plants (nat. ord. Gentianeæ), growing in the mountainous districts of Europe. An American species, *G. Catesbæi*, Blue Gentian, is considered nearly equal in value to the official species. It contains an active, bitter glucoside, *Gentopicrin* or *Gentianin*, $C_{20}H_{30}O_{12}$, which is crystalline and soluble in water, also an inert, amorphous body, *Gentianic* or *Gentesic Acid*, gum, considerable sugar, and a trace of volatile oil, but no tannin.

Preparations.

Extractum Gentianæ, *Extract of Gentian*,—aqueous. Dose, gr. j–v.
Extractum Gentianæ Fluidum, *Fluid Extract of Gentian*. Dose, ʒ ss–j.

Tinctura Gentianæ Composita, *Compound Tincture of Gentian,*—Gentian 10, Bitter Orange Peel 4, Cardamom 1, Alcohol and Water to 100. Dose, ʒss–ij.

Unofficial Preparations.

Infusum Gentianæ Compositum, *Compound Infusion of Gentian,*—contains Gentian 10, Bitter Orange Peel 2½, Coriander 2½, Alcohol 40, Water to 320. Dose, ʒj–℥j.

Mistura Gentianæ Alkalina, *Alkaline Mixture of Gentian,*—Ac. Hydrocyan. Dil. ♏iij, Sodii Bicarb. gr. xv, Infusum Gentianæ Co. to ℥j. One dose.

Mistura Gentianæ et Sennæ, *Mixture of Gentian and Senna,*—Infusum Sennæ ʒiij, Tr. Cardamomi Co. ʒj, Infusum Gentianæ Co. ʒvj. One dose.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Gentian is a simple bitter without astringency or aroma, its action corresponding to that of Calumba, but it is more apt to disagree with the stomach. In addition, like Cornus, a member of the same class, it has considerable repute as an antiperiodic and febrifuge. Gentian has been considered a valuable tonic throughout Europe from the earliest historical times. It is highly esteemed as a stomachic tonic in dyspepsia connected with the gouty diathesis, in hysteria, jaundice, and convalescence from acute diseases and from malarial fever. The compound tincture is an excellent vehicle for cod-liver oil, and the infusion is a good vehicle for the administration of chalybeates, mineral acids and neutral salts. The discoloration which iron salts make with gentian preparations is probably due to gentesic acid and not to tannin, as it contains none of the latter.

GERANIUM, Cranesbill,—is the rhizome of the indigenous perennial *Geranium maculatum* (nat. ord. Geraniaceæ). Its active constituents are tannic and gallic acids.

Extractum Geranii Fluidum, *Fluid Extract of Geranium.*—Dose, ♏v–ʒj.

Geranium is an efficient astringent, and its action corresponds with that of Tannic Acid. Having no unpleasant taste it is a useful agent for infants and others having delicate stomachs, and is a very popular domestic remedy in many parts of the country. It is especially used in diarrheas, dysentery, cholera infantum, hemorrhages, relaxed conditions of mucous membranes, gleet and leucorrhea.

GLYCERINUM, Glycerin,—is a liquid obtained by the decomposition of vegetable or animal fats or fixed oils, containing not less than 95 per cent. of absolute Glycerin, $C_3H_5(HO)_3$, which is a Trihydric Alcohol existing in fats and fixed oils in combination with the fatty acids.

Glycerin is a clear and colorless liquid, of syrupy consistence, hygroscopic, non-drying, odorless, of warm and very sweet taste, neutral reaction, sp. gr. 1.250, soluble in water and in alcohol, insoluble in ether, chloroform and fixed oils. It dissolves Tannin, Gallic Acid, Carbolic Acid, Salicylic Acid, Bromine, Iodine, etc., and with the aid of heat metallic salts and oxides, alkaloids, etc. With strong Nitric Acid it forms Nitro- rin, and it reduces Potassium Permanganate, Chromic Acid and Chlorinated Lime eat violence. An impurity frequently present in it is *Acrolein*, formed by the use igh a degree of heat in its manufacture, and which is very acrid and poisonous. n is a constituent of the 6 Glycerites, Pilulæ Phosphori, Mucilago Tragacanthæ, Hydrargyri, and several extracts and fluid extracts. Dose, ʒj–ij, diluted.

Preparations.

Suppositoria Glycerini, *Suppositories of Glycerin,*—each has Sodium Carbonate grains 4½, Stearic Acid grains 7½, dissolved by heat in 90 grains of Glycerin, cooled in a mould, and wrapped in tin-foil. Used per rectum in chronic constipation.

Glycerites of Carbolic Acid, Tannic Acid, Starch, Boroglycerin, Hydrastis, Yolk of Egg,—are described under the titles of their respective ingredients.

Glycozone (Unofficial),—is described under OXYGENIUM.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Glycerin is highly antiseptic, abstracts water from tissues with which it comes in contact, and unless pure is often very irritating to the skin. It is freely absorbed by the cutaneous and mucous surfaces, and is decomposed in the system, passing out as formic and other acids. On the stomach it has no particular action, but in large quantities it is laxative and is said to cause the solution of the red blood corpuscles and hemoglobinuria. The urine of persons using glycerin contains a body which acts like sugar in the copper and fermentation tests, but is not sugar. Glycerin is a good emollient and is considered nutritive by many authorities. It has been used as a substitute for cod-liver oil in wasting diseases, but with little benefit. It has also been tried as a remedy in diabetes, but with unsatisfactory results so far as reported, except as a sweetening substitute for sugar in the dietary of those afflicted with that disease. It is said to be fatal to intestinal trichinæ, and to be an efficient internal remedy in acne and flatulence. In chronic constipation, most excellent results are obtained from rectal enemata of Glycerin, or from the official suppositories thereof. As a vehicle it is used for many drugs, and is a good ingredient of solutions for hypodermic use, promoting the solubility of many alkaloids and acting as an antiseptic. It is also employed to preserve and aid the action of the digestive ferments, Pepsin and Pancreatin, as well as to prevent the decomposition of vaccine lymph. Locally it is valuable in many cutaneous affections as an emollient and softening agent. In acute coryza it gives great relief if applied by a brush or as a spray to the nasal mucous membrane. It is used on cotton to the cervix uteri as a depleting agent, and mixed with an infusion of flaxseed as an enema to relieve tenesmus in acute dysentery. With tincture of Benzoin it is an excellent application to chapped hands or lips and fissured nipples. In the external auditory canal it is usefully employed to soften cerumen, diminish the secretion of pus, deplete the tissues, and keep the surface moist.

Unna's Paste (Unofficial),—is a mixture of equal parts of glycerin and mucilage of acacia, with which are incorporated various substances, such as zinc oxide, mercuric oxide, etc.

Unna's Paint (Unofficial),—has of Glycerin 10, Gelatin 4, Zinc Oxide 4, and Water 10, incorporated together to form a white mixture, which when cold resembles white rubber. It is applied on gauze bandages for chronic ulcers, sprains and eczematous patches with induration. The glycerin has a dehydrating effect upon edematous tissues, the gelatin forms the basis of the paint and imparts elasticity to the finished dressing. The zinc oxide is soothing to the skin, especially when the dressing is applied to a chronic eczema.

Antiphlogistine (Unofficial),—is the trade name of a preparation very similar to Unna's Paint, and stated by its manufacturers to be "composed of Glycerin, Boric Acid, Salicylic Acid, Iron Carbonate, Peppermint, Gaultheria, Eucalyptus and Iodine, combined with the base de-hydrated Oxide of the Silicate of Alumina and Magnesia; which combination results in a chemical compound possessing antiseptic, anodyne, nutrient and antiphlogistic properties." It is used as a dressing or poultice applied to the surface of the body for inflammatory conditions of the skin, muscles and joints, also in pneumonia, pleurisy, peritonitis, acute rheumatism, etc., with the object of abstracting water from the tissues and thereby relieving tension; and in cases of deep-seated inflammation to produce a superficial hyperemia and thus relieve the affected part.

GLYCYRRHIZA, Glycyrrhiza, *Liquorice Root*,—is the root of *Glycyrrhiza glabra*, var. *glandulifera*, a plant of the nat. ord. Leguminosæ, native in southern Europe and Asia, but largely cultivated in many other parts. It contains a yellow, amorphous glucoside, *Glycyrrhizin*, $C_{24}H_{36}O_9$, also *Glycyrrhizic Acid*, *Asparagin*, sugar, resin, gum, etc. Glycyrrhizin when boiled with dilute acids yields glucose and a very bitter substance named *Glycyrrhetin*.

Preparations.

Extractum Glycyrrhizæ, *Extract of Glycyrrhiza*,—is the commercial extract of the root, occurring in glossy-black rolls, of sweet, peculiar taste. Not less than 60 per cent. of it should be soluble in cold water.

Extractum Glycyrrhizæ Purum, *Pure Extract of Glycyrrhiza*,—made with Aqua Ammoniæ and Water, by percolation and evaporation. Dose, indefinite.

Extractum Glycyrrhizæ Fluidum, *Fluid Extract of Glycyrrhiza*,—made with Aqua Ammoniæ and diluted Alcohol. Dose, indefinite.

Mistura Glycyrrhizæ Composita, *Compound Mixture of Glycyrrhiza*, *Brown Mixture*,—has of the Pure Extract 3 parts, Syrup 5, Acacia 3, Tr. Opii Camph. 12, Vinum Antimonii 6, Spt. Ætheris Nitrosi 3, and Water to 100. Dose, ʒj-℥j.

Pulvis Glycyrrhizæ Compositus, *Compound Liquorice Powder*,—Senna 18, Glycyrrhiza 23½, Oil of Fennel 4, Washed Sulphur 8, Sugar 50 parts. Dose, ʒj.

Trochisci Glycyrrhizæ et Opii, *Troches of Glycyrrhiza and Opium*,—each has of Extract of Glycyrrhiza gr. ij, Powdered Opium gr. $\frac{1}{12}$, Acacia, Sugar and Oil of Anise. Dose, j–ij every hour.

Glycyrrhizinum Ammoniatum, *Ammoniated Glycyrrhizin*,—the sweet principle of Liquorice rendered soluble by Ammonia and therefore tastable, believed to be the form in which Glycyrrhizin exists in the root. Occurs in brownish-red scales, very sweet, and soluble in water or in alcohol. Dose, gr. v–xv. Is a constituent of *Velatine*, for which see page 276.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Liquorice is demulcent and mildly laxative. It has an agreeable taste, and increases the flow of saliva and mucus when slowly chewed or sucked, the increased secretions acting as emollients to the throat. It is used in many pharmaceutical preparations, covering the taste of senna, senega, hyoscyamus, turpentine, ammonium chloride, the bitter sulphates, and to some degree the bitterness of quinine. The powdered extract or root is used as an excipient in pills and troches. The compound mixture is an efficient expectorant, much employed in acute bronchitis and catarrhal laryngitis, but owing its power over cough mainly to the opium contained in it. The compound powder is a gentle laxative, of which senna is the most active ingredient. The troches are used for cough, but must be carefully prescribed for children, as each troche contains gr. $\frac{1}{18}$ of powdered opium.

GOSSYPIUM, Cotton,—is the hairs of the seed of *Gossypium herbaceum*, and of other species of *Gossypium* (nat. ord. Malvaceæ), freed from adhering impurities and deprived of fatty matter. In this form it is official as **Gossypium Purificatum,** *Purified Cotton, Absorbent Cotton,* insoluble in ordinary solvents, but soluble in copper-ammonium-sulphate solution. Cotton-fibre is familiar in appearance to every one, but when examined microscopically it shows as flattened, hollow and twisted bands, spirally striate, and slightly thickened at the edges. It is a modification of Cellulose, $C_{12}H_{10}O_{10}$, and corresponds therewith in all its ordinary chemical properties.

Preparations of the Cotton Plant.

Gossypii Radicis Cortex, *Cotton Root Bark,*—thin bands or quilled pieces, brownish-yellow exteriorly, white interiorly, of slightly acrid and astringent taste. Dose, gr. xxx–ʒj.

Extractum Gossypii Radicis Fluidum, *Fluid Extract of Cotton Root Bark,*—made with Glycerin and Alcohol, by maceration and percolation. Dose, ♏xxx–ʒj.

Oleum Gossypii Seminis, *Cotton-seed Oil,*—the fixed oil expressed from the seeds and purified. Is yellow, odorless, of bland taste and neutral reaction, soluble in ether, but slightly soluble in alcohol. Is introduced into the pharmacopœia for the reason that it constitutes most of the "Olive Oil" sold in foreign-shaped bottles and under foreign-appearing labels. It is used in the official Liniments of Ammonia and Camphor.

Pyroxylinum, *Pyroxylin, Soluble Gun-cotton, Colloxylin,*—is official for the purpose of making Collodium. It is prepared by macerating Cotton in a mixture of Sulphuric and Nitric Acids, washing, draining and drying.

Collodium, *Collodion,*—made by dissolving Pyroxylin 3, in Ether 75 and Alcohol 25.

Collodium Flexile, *Flexible Collodion,*—Collodion 92, Canada Turpentine 5, Castor Oil 3, mixed thoroughly.

Collodium Stypticum, *Styptic Collodion,*—Ether 25, Alcohol 5, Tannic Acid 20, Collodion to 100.

Collodium Cantharidatum, *Cantharidal Collodion, Blistering Collodion,*—Cantharides 60, Flexible Collodion 85, Chloroform q. s. to 100.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Cotton-root is believed to be an efficient emmenagogue and oxytocic by Southern practitioners, also somewhat of a galactagogue, but experiments on pregnant animals have not confirmed this view of its action. The Oil of the seed is very bland and may be applied to all the purposes for which olive oil is used. Cotton itself, when freed from oily matter, is remarkably absorbent of water, and is a good agent for excluding air from injured surfaces. Pyroxylin is highly inflammable, and explosive at 300° F. Collodion is also inflammable, and rapidly dries on exposure to the atmosphere by evaporation of its ether, leaving a transparent film of Pyroxylin on the surface to which it has been applied; which film, if the flexible collodion be used, does not contract on drying or readily crack, making it an excellent protective application. Styptic Collodion is a solution of Tannin, and is an excellent hemostatic. Cantharidal Collodion is a convenient blistering agent, suitable for cases where the patient is inclined to remove a blister if applied in the ordinary way.

Absorbent Cotton is a valuable agent in surgical practice, being employed as an application in burns and scalds, erysipelas, articular rheumatism, etc., to exclude the atmosphere, allay pain, and when covered with oiled silk or rubber cloth to keep up local perspiration. It may be carbolated, borated or salicylated, by soaking in the respective solutions, and is then used as an antiseptic dressing for wounds, ulcers, etc. It is employed by the pharmacist in funnels to filter oils, and for the preparation of the official waters.

Cotton-root bark is much employed by the negroes of the Southern States in decoction as a supposed abortifacient, oxytocic and emmenagogue. It is used in the South for intensifying uterine action in normal labor, also in dysmenorrhea and amenorrhea. A decoction, ℥iv in a quart of water boiled to a pint, is the favorite preparation, administered in wineglassful doses.

Collodion is used as a protective covering for superficial burns, ulcers and wounds, slight cuts, cracked nipples, anal fissures, and erysipelas. For these affections the flexible collodion should be used, but where it is desirable to produce pressure on the part the ordinary form is best, as it contracts with considerable force in drying. This property makes it highly useful in drawing the edges of wounds together, bringing pressure on buboes, incipient boils, carbuncles, etc. Styptic Collodion has many uses as a hemostatic and protective which will suggest themselves, and the cantharidal form is a convenient epispastic for uneven surfaces, the therapeutics of which are detailed under CANTHARIS.

GRANATUM, Pomegranate,—is the bark of the stem and root of *Punica Granatum*; a small tree of the nat. ord. Lithrarieæ, cultivated in subtropical countries. It contains Tannic and Punico-tannic Acids, Mannite and an active liquid alkaloid *Pelletierine*, $C_8H_{13}NO$, which is soluble in water, alcohol, ether, chloroform, etc., and has strong basic properties. There are no official preparations.

Unofficial Preparations.

ctum **Granati Fluidum,** *Fluid Extract of Pomegranate.*—Dose, ʒss–jss.

m **Granati,** *Decoction of Pomegranate,*—ʒxvij of bark from the fresh root
iling water, boiled down to ℥xij and strained. Dose, ℥iv–vj every hour,

preceded and followed in a few hours by a brisk cathartic. The decoction of the Br. Phar. is of 1 to 10 strength and is given in doses of ℥ss–ij.

Pelletierinæ Tannas, *Pelletierine Tannate.*—Dose, gr. v–x, taken fasting and followed in 15 minutes by a sharp purgative, as Castor Oil.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Granatum and its alkaloid are teniafuge, and very efficiently so, rarely failing to bring away the whole worm. The decoction is usually employed, but latterly Pelletierine has been coming into fashion, a proprietary form being sold as *Tanret's Pelletierine* in bottles containing one adult dose at three dollars each. The decoction in full doses causes nausea and vomiting, flatulence, purging, and sometimes cramps in the legs, giddiness, dimness of vision, general numbness of the limbs and increase of the quantity of urine.

For the expulsion of tape-worm a mixed treatment by Pomegranate-root bark, Pumpkin seeds and Oleoresin of Male-fern is preferred by many practitioners. The following formula has proved very efficient. ℞. Granati ℥ij, Aquæ Ojss, boiled to ℥vij; Peponis ℥j, deprived of outer coats and beaten to a paste with fine powdered sugar; Oleoresinæ Aspidii, gr. xxx, made into emulsion with Acacia and the above decoction of Granatum, then added to the paste of Pepo, and flavored with Syrups up to ℥ix. One-third of this to be taken in the morning after a light diet and a laxative on the previous day. If not successful the second and third portions may be taken at intervals of 3 hours. The worm should be passed sitting in a tepid sitz-bath, to prevent the expelled portion tearing off the head by its weight.

GRINDELIA,—is the leaves and flowering tops of *Grindelia robusta*, and of *Grindelia squarrosa*, herbaceous perennial plants of the nat. ord. Compositæ, indigenous to the Pacific slope of the United States and Mexico, where they are common along the coast and in the mountains, having yellow flowers, a balsamic odor and a pungent, aromatic and bitter taste. They contain a resin, which is probably the active constituent, a fixed and a volatile oil, also *Robustic Acid* and an alkaline principle named *Grindeline*. There is but one official preparation.

Extractum Grindeliæ Fluidum, *Fluid Extract of Grindelia,*—is alcoholic and contains much resin. Dose, ♏x–ʒj or more, every 3 or 4 hours, in sweetened water or milk, the mixture being well stirred to prevent the resin adhering to the glass.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Grindelia has an acrid, bitter taste, and excites the secretion of saliva when chewed. Its principal action is that of an antispasmodic, but it is also a motor-depressant, somewhat expectorant and decidedly diuretic. Given in large doses to small animals it induces paralysis, beginning in the hind extremities and affecting the sensory nerve-trunks first, then the sensory side of the spinal cord, afterwards involving the motor nerve-trunks, and finally the spinal motor tract. It stimulates the cardiac inhibitory apparatus and the vaso-motor centre, slowing the heart and respiration, and raising the blood-pressure. In sufficient quantity it causes dilatation of the pupils, reduced cutaneous sensibility and sluggish reflexes, even narcotism in small animals. Its elimination occurs by the bronchial mucous membrane and the kidneys, both of which it stimulates, and in large doses it has produced renal irritation.

Grindelia is chiefly employed as a palliative in spasmodic asthma and the dyspnea accompanying bronchitis. In several cases of recurring asthma in elderly persons ʒss of the fluid extract has afforded almost instantaneous relief, but has not prevented the return of the paroxysms. It is an efficient remedy in chronic bronchitis, especially that of the aged, also in whooping-cough and other spasmodic coughs, in hay fever and in the dyspnea of various pulmonary and cardiac affections, and has been employed with benefit in chronic cystitis. Locally, it is used with advantage as a lotion for the dressing of burns and blisters, in vaginitis and uterine catarrh, and to allay the pain of herpes zoster. In the proportion of 1 part of the fluid extract to 9 of water, as a sedative lotion, it is a very efficient application for the cutaneous irritation due to poison-oak or ivy, also in skin diseases attended with itching and burning sensations.

GUAIACUM, Lignum Vitæ,—is official in two forms,—GUAIACI LIGNUM, the heart-wood of *Guaiacum officinale* and of *Guaiacum sanctum*, and GUAIACI RESINA, *Guaiac*, the resin of the wood of *Guaiacum officinale*, a large West Indian tree of the nat. ord. Zygophylleæ. The Resin is the important constituent, and itself consists of three resins, namely, *Guaiaconic Acid*, $C_{19}H_{20}O_5$, 70 per cent., *Guaiac Acid*, $C_6H_8O_3$, resembling Benzoic Acid, and *Guaiarec Acid*, $C_{20}H_{26}O_4$; also an indifferent resin. The wood also contains a yellow coloring matter, gum, etc., and yields, by destructive distillation, *Guaiacol* (see *ante*, page 291).

Guaiaci Lignum, *Guaiacum Wood*,—generally used in the form of raspings, of a greenish-brown color, resinous odor, taste slightly acrid. Is a constituent of Decoctum Sarsaparillæ Compositum.

Guaiaci Resina, *Guaiac*,—occurs in large masses of a greenish-brown or reddish-brown color, fracture having a glassy lustre, insoluble in water, soluble in alcohol, ether, chloroform and alkaline fluids. Dose, gr. v–xxx, in wafer. Is a constituent of Pil. Antimonii Compositæ.

Preparations.

Tinctura Guaiaci, *Tincture of Guaiac*,—20 per cent. Dose, ♏v–ʒj, in mucilage syrups, as the resin is precipitated by water.

Tinctura Guaiaci Ammoniata, *Ammoniated Tincture of Guaiac*,—has of Guaiac Aromatic Spirit of Ammonia to 100. Dose, ♏x–ʒss.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Guaiac is diaphoretic, expectorant and alterative; also laxative and purgative, according to the dose administered. Its taste is acrid and very disagreeable. Internally it is a local stimulant, producing salivation, an acrid sensation in the throat, warmth in the epigastrium, increase of the gastric and intestinal secretions and the flow of bile, and reflex stimulation of the heart. Its continued use causes gastric catarrh, and in large doses it is a gastro-intestinal irritant, causing vomiting, purging and severe congestive headache. Though a colloidal body it enters the blood, stimulates the liver and other excretory glands and the production of bronchial mucus, and causes increased circulation and diaphoresis. Sometimes it fails to act on the skin and then it is markedly diuretic.

Mineral Acids and Spirit of Nitrous Ether are chemically incompatible with Guaiac preparations.

Guaiac was first used as an antisyphilitic, being employed in decoction and in large quantity, with a spare diet and external warmth. It acquired a great reputation in that disease during the 16th century, but it is now abandoned therefor except as an ingredient of the Compound Decoction of Sarsaparilla. It is a very efficient remedy in tonsillitis, given in ʒss doses of the tincture in emulsion with mucilage or yolk of egg, to abate the inflammation and abort the disease. It has considerable reputation in neuralgic dysmenorrhea, amenorrhea, chronic rheumatism, gout, lumbago and sciatica. The ammoniated tincture in water makes a cleanly and not very disagreeable gargle. The effectiveness of Guaiac in many chronic and obscure complaints is due, partly to its purgative property and partly to its nastiness, a quality which is highly appreciated by many patients.

GUARANA,—is a dried paste consisting chiefly of the crushed or pounded seeds of *Paullinia Cupana*, a climbing plant of the nat. ord. Sapindaceæ, growing in Brazil. It occurs in brown cakes or sticks, having an odor of chocolate, and a bitter, astringent taste, partly soluble in water and in alcohol. It contains 25 per cent. of tannic acid, gum, albumin, starch, and a greenish fixed oil, also an alkaloid *Guaranine* (5 per cent.), which is thought to be identical with *Caffeine*. The specimens of Guarana in the market are very untrustworthy, unequal in quality and expensive, it being a secret mixture prepared in Brazil. Hence it has been omitted from the list of Squibb's preparations, a fluid extract of green coffee being substituted in its place.

Extractum Guaranæ Fluidum, *Fluid Extract of Guarana*,—Dose, ♏x–ʒij.

Guarana has similar actions to those of Coffee, the active principles of both plants being perhaps identical, both chemically and physiologically. It is chiefly employed in the treatment of nervous sick-headache (migraine) administered in half-drachm doses of the fluid extract when the attack is developing. It has been used in the diarrhea of phthisis, in convalescence from acute diseases, and generally in conditions requiring tonic treatment.

GURJUN BALSAM, Balsamum Dipterocarpi, *Wood Oil* (Unofficial),—is an oleoresin obtained from incisions in various trees of the genus Dipterocarpus, growing in

India. It is thick, opaque and grayish-brown by reflected light, soluble in chloroform and partly so in alcohol, ether and volatile oils, odor balsamic, taste bitter. It contains from 40 to 70 per cent. of a Volatile Oil, a Resin and *Gurjunic Acid.* Dose, ♏x–ʒij, in emulsion, or in capsules.

The properties of this balsam are similar to those of Copaiba, but it is less disagreeable and less apt to upset the stomach, also less actively diuretic. It has been used with good success in leprosy, given internally in full doses and used locally at the same time. Mixed with 4 parts of Lime-water it is well applied in chronic eczema, lupus and psoriasis.

HÆMATOXYLON, Log-wood,—is the heart-wood of *Hæmatoxylon campechianum*, a tree of the nat. ord. Leguminosæ, native of tropical America, but naturalized in the West Indies. It occurs in chips or powder of a dark brown-red color, often with a greenish lustre, and colors the saliva a dark pink when chewed. It contains Tannic Acid, and a sweet, crystalline coloring principle named *Hæmatoxylon*, $C_{16}H_{14}O_6$, which is colorless when pure, but turns red on exposure to light.

Extractum Hæmatoxyli, *Extract of Hæmatoxylon.* Dose, gr. v–xx.

Decoctum Hæmatoxyli (Unofficial),—strength 1 in 17. Dose, ℥j–ij.

Logwood is mildly astringent, its properties depending on the Tannin contained in it. As it is devoid of irritating qualities it is well adapted to the diarrheas and hemorrhages of young children. It does not produce constipation or disorder the bowels, but colors the urine and stools blood-red, and has caused phlebitis. It has been used as a hemostatic in bleeding of the lungs, and in hemorrhages from the uterus and intestines, also as an astringent injection in leucorrhea.

HAMAMELIS, Witch-hazel,—the leaves, collected in autumn, of *Hamamelis virginiana*, a shrub of the nat. ord. Hamamelaceæ, growing in the United States. They contain about 8 per cent. of Tannic Acid, a bitter principle and probably some volatile matters, but the chemistry of the plant has not been fully studied.

Preparations.

Extractum Hamamelidis Fluidum, *Fluid Extract of Hamamelis.* Dose, ♏j–ʒj. It is the only official preparation, and is prepared from the leaves.

Hamamelin (Unofficial),—is an uncertain extract of very indefinite composition. Dose, gr. j–ij.

Distilled Extracts, so-called, but really Waters distilled from the bark, are sold by various manufacturers and are said by the vendors to contain the volatile principles of the plant. **Pond's Extract** is such a preparation, said to be made by distilling the bark with a very dilute alcohol, and is a proprietary medicine of uncertain composition.

No trustworthy experimentation has yet been made with this drug. It is tonic, astringent, styptic and sedative, owing most of its properties to its tannin, but appears to possess some special influence over the venous circulation similar to that of Aconite on the arterial system. In full doses it may produce severe throbbing pain in the head. It is used both internally and locally with great benefit in hemorrhoids, particularly those of the bleeding variety, varicose veins and ulcers, varicocele, venous congestions and threatening local inflammations. It is highly recommended in hemorrhages from the nose, stomach, lungs, rectum and kidneys, in threatened abortion, and externally for sprains and bruises, foul ulcers, the pruritus of eczema, also in leucorrhea and gonorrhea. An ointment of Witch-hazel is found in the shops, and suppositories may be prepared extemporaneously by evaporating the fluid extract and incorporating the residue with cacao-butter.

HEDEOMA, Pennyroyal,—the leaves and tops of *Hedeoma pulegioides*, a plant of the nat. ord. Labiatæ, common to all parts of the U. S. Its only important constituent is the Volatile Oil, which is official.

Oleum Hedeomæ, *Oil of Pennyroyal,*—is the volatile oil, readily soluble in alcohol. Dose, ♏ij–x.

Spiritus Hedeomæ, *Spirit of Pennyroyal* (Unofficial),—contains 1 part of the oil in 9 of alcohol. Used externally or as a spray.

Hedeoma is a stimulant aromatic, also somewhat carminative and emmenagogue. Its odor is extremely repulsive to insects, especially fleas and mosquitoes. In warm infusion it is a popular remedy for amenorrhea and flatulent colic. It may be used as a corrective with other medicines, and the spirit is well employed on the hands and face to keep away mosquitoes. The writer has known death by narcosis to result from an overdose of the oil self-taken to produce an abortion.

HELLEBORUS, Hellebore (Unofficial),—the rhizome and rootlets of *Helleborus niger* (Black Hellebore) and *Helleborus viridis* (Green Hellebore), plants of the nat. ord. Ranunculaceæ, natives of Europe. A third variety, *Helleborus occidentalis*, growing in Greece, is probably the true Hellebore of the ancients. Its most important constituents are two glucosides, *Helleborin* and *Helleboreïn*, both crystalline and poisonous.

Unofficial Preparations.

Extractum Hellebori Nigri, *Extract of Black Hellebore.* Dose, gr. j–x cautiously.

Extractum Hellebori Nigri Fluidum, *Fluid Extr. of Black H.* Dose, ♏ij–xv.

Helleborin, $C_{36}H_{42}O_6$,—insoluble in water, soluble in alcohol, and in chloroform.

Helleboreïn, $C_{26}H_{44}O_{15}$,—crystalline, very soluble in water, slightly so in alcohol, insoluble in ether. Dose, gr. $\frac{1}{16}$–$\frac{1}{10}$.

Physiological Action and Therapeutics.

Black Hellebore is a drastic, hydragogue cathartic, and an emmenagogue. In overdoses it is a violent gastro-intestinal irritant, producing vomiting, hypercatharsis, vertigo, cramps and convulsions, which may result fatally. Locally applied, the fresh root is violently irritant to the skin, producing inflammation and vesication.

Helleborin is an active poison, acting on the tongue like Aconite, and on the nervous system as a narcotic, producing in animals paresis of motion and sensation, cerebral and spinal congestion, dilated pupils and death. It is less irritant than Helleboreïn to the mucous membranes.

Helleboreïn is less actively toxic to animals, but is very irritant, producing conjunctivitis, sneezing, salivation, nausea, vomiting and purging. It affects the heart like Digitalis, small doses frequently repeated slowing its action, but large ones quicken it and then suddenly paralyze it through the pneumogastric nerve. Respiration is at first accelerated, then slowed and rendered laborious. Diuresis is a constant result, the kidneys and uterus are congested, gradual paralysis and severe convulsions follow, and death occurs by paralysis of the heart.

Black Hellebore is an old remedy, having been highly esteemed by the early physicians in insanity, dropsies, worms, cutaneous affections and amenorrhea. It has gone out of fashion, but might be usefully employed in dropsies and as a revulsant in acute cerebral affections. Helleboreïn has come into notice as a substitute for Digitalis in cardiac affections, being of less bulk and more definite composition. Its action on the heart is attained by doses much smaller than those necessary to produce its irritant effects on the gastro-intestinal canal. Its solubility in water and the freedom with which it can be used hypodermically are important qualities to recommend it.

HOANG-NAN, or **Hwang-Nao** (Unofficial),—is the bark of *Strychnos Gautheriana*, Tropical Bind-weed, a creeping vine of the nat. ord. Loganiaceæ, found in the mountains of Tonquin. It contains the alkaloids *Strychnine* and *Brucine*, thus resembling in composition its congeners Nux Vomica and Ignatia, but differing from them, as they do from each other, in the proportional quantities in which the alkaloids are contained,—Brucine predominating in this plant, as Strychnine does in the other two.

Like the other members of the Strychnos family, Hoang-Nan is an active tetanizer, its action generally corresponding to that of Nux Vomica. It was first brought into notice by the missionary fathers stationed in the French colonies in Asia, they having found its employment general among the natives for leprosy and hydrophobia. Along the coast of Tonquin and Cochin-China, and in Pondicherry, Trinidad, Venezuela, etc., it has an established reputation in the two terrible diseases mentioned, also as a remedy for the bites of venomous serpents and other reptiles, scrofulous and syphilitic ulcers, indolent sores, etc. It has been used successfully for malarial fevers, in lieu of quinine, and is highly spoken of by Father Brosse, as a stimulant to the intellect, without producing any subsequent depression.

The dose of the powdered drug is about gr. iij–v; of the aceto-alcoholic Extract, gr. ⅛–½; and of the concentrated Tincture, ♏ j–v.

HUMULUS, Hops,—the strobiles (fruit-cones) of *Humulus Lupulus*, a cultivated creeping plant of the nat. ord. Urticaceæ. Its constituents are wax, resins (50 per cent.), tannin (5 per cent.), a liquid volatile alkaloid named *Lupuline*, a Volatile Oil (2 per cent.) which consists in part of *Valerol* and *Trimethylamine*, and the crystalline, bitter principle, *Lupulinic Acid* (11 per cent.). These, except tannin, are more abundant in the glandular powder of the strobiles, which is named *Lupulin*.

Preparations.

Tinctura Humuli, *Tincture of Hops*,—strength 20 per cent. Dose, ʒj–ij.

Infusum Humuli, *Infusion of Hops* (Unofficial),—℥ss to the pint. Dose, ℥j–iv.

Lupulinum, *Lupulin*,—is the glandular powder separated from the strobiles, of ght, brownish-yellow color, aromatic and bitter taste. The Volatile Oil resides in the pulin grains, and contains *Valerol*, which is changed into *Valerianic Acid* by long ex-ure, giving a disagreeable odor to old hops. Dose, gr. v–xv.

Extractum Lupulini Fluidum, *Fl. Ext. of Lupulin*,—alcoholic. Dose, ♏x–ʒj.
Oleoresina Lupulini, *Oleoresin of Lupulin*,—an ethereal extract. Dose, gr. ij–v.
Tinctura Lupulini, *Tincture of Lupulin* (Unofficial),—strength ⅛. Dose, ʒss–ij.
Mineral acids and metallic salts are chemically incompatible with preparations of Hops.

Humulus is a bitter tonic, and a feeble hypnotic, also somewhat diaphoretic, astringent and anaphrodisiac. It increases the cardiac action and the cutaneous circulation. After slight cerebral excitement it produces calm and a soporific disposition, especially if the solution administered be strongly alcoholic. The stomachic and tonic effects are due to the bitter principle, Lupulinic Acid, and are found in bitter ale. The primary stimulant and secondary sedative effects are due to the volatile oil and are also possessed by ales and beer.

Hops are used as a tonic and calmative in delirium tremens, in which a combination of the tincture with tincture of capsicum is very efficient and is an excellent substitute for alcohol. In dyspepsia of atonic form Humulus is an excellent stomachic tonic, and in nervous irritability the fluid extract of Lupulin may be used as a calmative and hypnotic, or the hop-pillow, which certainly exercises considerable influence, imaginary or otherwise. A poultice of hops is a favorite domestic application in inflammations and pain. Lupulin has been used with benefit in irritable bladder and alcoholism, and as an anaphrodisiac in the treatment of chordee, gonorrhea, spermatorrhea and other affections of the genito-urinary organs.

HYDRANGEA (Unofficial),—is the root of *Hydrangea arborescens*, a plant of the nat. ord. Saxifragaceæ, growing in the southeastern U. S. It is a white, tough root, containing gum, albumin, starch, resin, and a ferrous salt, with other salts. Dose, ʒss–ʒij, best in fluid extract. A decoction of the root may be prepared and used in doses of ℥j–ij.

Hydrangea has been long used by the Cherokee Indians in calculous affections, and reports of cases by competent observers show that it is of unquestionable utility in this class of disorders, promoting the removal of gravel from the bladder, and relieving pain during the passage of renal concretions through the ureters. Large doses produce vertigo, oppression of the chest, and considerable cerebral disturbance.

HYDRARGYRUM, Mercury, Quicksilver, Hg,—is a shining, silver-white metal, fluid and slowly volatile at ordinary temperatures, solidifies at —39° F., boils at 675° F., volatilizes without residue, insoluble in ordinary solvents, wholly soluble in nitric acid, odorless and tasteless, sp. gr. 13.558 at 59° F.

Preparations of Mercury.

Hydrargyrum cum Creta, *Mercury with Chalk, Gray Powder*,—has of Mercury 38, Honey 10, Prepared Chalk 57, Water q. s., shaken and triturated together and dried to 100, then reduced to a uniform gray powder. Dose, gr. ss–x.

Massa Hydrargyri, *Mass of Mercury, Blue Mass, Blue Pill*,—has of Mercury 33, Liquorice 5, Althæa 25, Glycerin 3, Honey of Rose 34. Each grain contains gr. ⅓ of Mercury. Dose, gr. ss–x.

Unguentum Hydrargyri, *Mercurial Ointment, Blue Ointment,*—Mercury 50, Lard 25, Suet 23, Oleate of Mercury 2, triturated together, until globules of Mercury cease to be visible under a lens having a magnifying power of ten diameters.

Emplastrum Hydrargyri, *Mercurial Plaster,*—Mercury 30, Oleate of Mercury 1.2, Lead Plaster to 100.

Emplastrum Ammoniaci cum Hydrargyro, *Ammoniac Plaster with Mercury,*—see *ante*, page 144.

Chlorides and their Preparations.

Hydrargyri Chloridum Corrosivum, *Corrosive Mercuric Chloride, Bichloride of Mercury, Corrosive Sublimate,* $HgCl_2$,—heavy, colorless crystals, of acrid, metallic taste, and acid reaction; soluble in 16 of water and in 3 of alcohol, in 2 of boiling water, 1.2 of boiling alcohol, 4 of ether and in about 14 of glycerin. Dose, gr. $\frac{1}{80}$–$\frac{1}{16}$.

Hydrargyri Chloridum Mite, *Mild Mercurous Chloride, Subchloride of Mercury, Calomel,* Hg_2Cl_2,—a heavy, white, impalpable powder, odorless and tasteless; insoluble in water, alcohol or ether. Is an ingredient of Pil. Antimonii Co. and Pil. Catharticæ Co. Dose, gr. $\frac{1}{20}$–x. The dose depends on the effect desired.

Hydrargyrum Ammoniatum, *Ammoniated Mercury, White Precipitate, Mercuric Ammonium Chloride,* NH_2HgCl,—is a white, insoluble powder, odorless and tasteless. Only used externally.

Unguentum Hydrargyri Ammoniati, *Ointment of Ammoniated Mercury, White Precipitate Ointment,*—Ammoniated Mercury 10, Benzoinated Lard 90 parts.

Oxides and their Preparations.

Hydrargyri Oxidum Flavum, *Yellow Mercuric Oxide,* HgO,—an orange-yellow, heavy, impalpable powder, odorless and tasteless, insoluble in water or alcohol, but wholly soluble in nitric or hydrochloric acid. Used to prepare:—

Unguentum Hydrargyri Oxidi Flavi, *Ointment of Yellow Mercuric Oxide,*—strength 1 to 9 of Ointment (Unguentum).

Oleatum Hydrargyri, *Oleate of Mercury,*—has of the Yellow Oxide 20, Oleic Acid 80 parts.

Hydrargyri Oxidum Rubrum, *Red Mercuric Oxide, Red Precipitate,* HgO,—a heavy, orange-red, crystalline powder, having the same properties as the yellow oxide, from which it differs only in being crystalline, and in not so minute a state of subdivision. Dose, gr. $\frac{1}{50}$–$\frac{1}{10}$.

Unguentum Hydrargyri Oxidi Rubri, *Ointment of Red Mercuric Oxide,*—strength 1 to 8½ of Unguentum and ½ of Castor Oil.

Iodides and their Preparations.

Hydrargyri Iodidum Rubrum, *Red Mercuric Iodide, Red Iodide* (*Biniodide*) *of Mercury,* HgI_2,—a scarlet-red, crystalline powder, almost insoluble in water, soluble in 130 of alcohol, in solution of Potassium Iodide or of Mercuric Chloride. Prepared by double decomposition between Potassium Iodide 5, and Mercuric Chloride 4 parts. Dose, gr. $\frac{1}{50}$–$\frac{1}{16}$.

Liquor Arsenii et Hydrargyri Iodidi, *Solution of Arsenic and Mercuric. Iodide, Donovan's Solution,*—see *ante*, page 199.

Hydrargyri Iodidum Flavum, *Yellow Mercurous Iodide, Protiodide of Mercury,* Hg_2I_2,—a dull green or greenish-yellow powder, insoluble in alcohol or ether and almost so in water. Dose, gr. $\frac{1}{10}$–$\frac{1}{3}$.

Acid Combinations and their Preparations.

Liquor Hydrargyri Nitratis, *Solution of Mercuric Nitrate,*—a liquid containing in solution about 60 per cent. of Mercuric Nitrate, $Hg(NO_3)_2$, with about 11 per cent. of free Nitric Acid. Prepared from the Red Mercuric Oxide 40, by Nitric Acid 45, and

15. Used as a caustic.

Hydrargyri Nitratis, *Ointment of Mercuric Nitrate, Citrine Oint-*

dissolved in Nitric Acid 7½, adding Lard Oil 76.

Hydrargyri Subsulphas Flavus,—*Yellow Mercuric Subsulphate, Basic Mercuric Sulphate, Turpeth Mineral,* $Hg(HgO)_2SO_4$,—a heavy, lemon-yellow powder, practically insoluble in water or alcohol, soluble in nitric acid, and in 10 of HCl without residue. Dose, as an emetic, gr. ij–v.

Cyanide.

Hydrargyri Cyanidum, *Mercuric Cyanide,* $Hg(CN)_2$,—colorless crystals, of metallic taste, soluble in 12.8 of water and in 15 of alcohol. Dose, gr. $\frac{1}{100}$–$\frac{1}{10}$.

Triturations.

These may be prepared according to the general formula under the title TRITURATIONS in the Pharmacopœia, 10 parts of the substance to 90 of Sugar of Milk. Mercury itself or any of its salts may be so treated with excellent results, the particles being much finer and therefore more easily absorbed than if rubbed up with another agent.

Unofficial Preparations.

Lotio Hydrargyri Flava, *Yellow Wash,*—prepared by adding Corrosive Sublimate gr. xviij to Lime-water ℥x, producing the yellow oxide; a favorite application for syphilitic sores.

Lotio Hydrargyri Nigra, *Black Wash,* prepared by adding Calomel gr. xxx to Lime-water ℥x, producing the black oxide, and used as an application to syphilitic sores.

Unguentum Hydrargyri Nitratis Rubrum,—*Red Ointment of Mercuric Nitrate, Brown Citrine Ointment,*—differs from the official ointment only in being made with Cod-liver Oil, which gives it a brown color, and a more agreeable odor.

PHYSIOLOGICAL ACTION.

Mercury is tonic, purgative, alterative, antiphlogistic and sorbefacient, and indirectly cholagogue. Some of its salts are corrosive poisons, others are local caustics, all produce by long-continued administration the peculiar cachexia termed Hydrargyrism. The metal itself is inert, and by combination with the acids and fluids of the body it becomes active, and is easily absorbed in any form, passing into the blood from the skin, mucous membranes, lungs and stomach, in each case probably as an oxyalbuminate of mercury. Entering the stomach in any form it is first converted into a double chloride of sodium and mercury, then uniting with the albuminous juices to form a complex molecule of mercury, sodium, chlorine and albumin, which being soluble in an excess of sodium chloride or albumin, exists in solution and is easily absorbed, then being decomposed in the blood and changed to the oxyalbuminate. Entering the intestines a purgative action is soon set up, of more or less severity according to the preparation used, a small portion only is absorbed, the rest being converted into a sulphide and excreted with the feces, unless combined with Opium, which delays its progress through the intestines and permits of its freer absorption. On the blood its effects in small doses are tonic, but in quantity it indirectly produces impoverishment thereof, impairs the ozonizing function, diminishes the red corpuscles, and consequently disorders nutrition and deranges digestion. From the blood it enters the tissues, where it remains for an indefinite period, exerting a peculiar influence, termed "alterative," on all processes characterized by growth of young cells, but not producing any definite anatomical changes either in the viscera or the nervous tissue, though in the latter a low form of inflammation arises, resulting in loss of coördination-power. It stimulates most of the glands of the body to the production of pathological secretions, especially the salivary glands and the pancreas, and is excreted with comparative slowness by all the excretory organs, being found in the saliva, sweat, milk, urine and bile. It tends to accumulate in the liver, while stimulating its cells, and is not a direct cholagogue, though stimulating the flow of bile already secreted by reflex action on the bile-ducts due to its purgation of the duodenum. Its excretion is hastened and completed by the use of Potassium Iodide.

In small doses administered for a short time the mercurial preparations are blood-tonics, improving the general condition, increasing the number of red corpuscles and the body-weight. They soon begin to promote waste by stimulating the lymphatic system, and if the small doses are long continued or the quantity is increased, symptoms of mercurial poisoning begin to manifest themselves.

The first symptoms of *Hydrargyrism* are fetid breath, swollen and spongy gums having a bluish line along their margins, stomatitis, sore and loosened teeth, inflamed and tender salivary glands pouring out a peculiar, thin saliva of foul odor in large quantity, and a metallic taste in the mouth. Anorexia, diarrhea and fever follow, also ulceration and in some cases even gangrene of the lips and tongue. If the use of the drug be continued nutrition will be greatly impaired through the extreme promotion of retrograde metamorphosis, and various nervous disturbances will follow, the effects being emaciation, pallor, edema, ulcerated skin, erythematous, vesicular or pustular eruptions, headache, insomnia, neuralgia, tremor through paresis of the muscles of the head and extremities, epilepsy, coma and convulsions. In pregnant women abortion will occur by reason of the impoverishment of the blood. Indeed, as Dr. Ringer said in the earlier editions of his *Handbook of Therapeutics*, the phenomena produced by mercury are singularly similar to those which will result from syphilis, and the serious symptoms known as secondary and tertiary syphilis can be produced both by syphilis and by mercury. The drug is a specific antagonist to the syphilitic virus, probably by reason of its affecting the same organs and tissues of the body on a similar line of action, both poisons mutually destroying each other in the organism. It is certainly capable of bringing about a radical cure of syphilis, if introduced into the system in considerable quantity and its use protracted over a very long time. the action of the drug in all cases being kept short of ptyalism or aced physiological effects.

ations on the antiphlogistic and sorbefacient actions of linical rather than physiological, but it is generally agreed that exhibited in inflammation mercurials antagonize the increase of the hemic fibrin which is so constant an effect of the inflammatory process, and that in chronic diseases attended by the formation of semi-organized deposits, a mild mercurial course will almost insensibly remove the new-formed material.

Salivation is most readily produced by blue mass, next by calomel, and less easily by gray powder. Individuals differ greatly in their susceptibility to the action of mercury, some persons having been affected after a single moderate dose. Children are not easily salivated. Inhalation of mercurial vapors is most apt to affect the nervous system; the internal administration and that by inunction are more likely to produce salivation. A not uncommon result of full doses of blue pill is an acute coryza of very severe character, which the writer has frequently observed to follow on neglect of the old-fashioned precaution to "work off" the mercurial by a saline cathartic. The symptoms produced are those of a severe attack of influenza,—epistaxis, conjunctivitis and obstinate muco-purulent discharge from the nasal passages being especially marked. Similar effects have been observed during physiological experiments with mercury on animals by Overbeck and Bennett.

Notes on the Action of the Preparations.

Metallic Mercury is not used internally except in the finely divided form obtained in blue pill and gray powder, which are capable of producing the effects previously described. Mercurial Ointment is the preparation generally used for inunction, a piece the size of a small nut being daily rubbed into the soft skin at the flexures of joints. The Oleate painted over the surface is a more cleanly method of making the same application. Both these preparations are efficient parasiticides.

The Bichloride is the most actively toxic of the mercurial salts. It is probably the most active zymoticide and parasiticide, a solution of 1 part in 2,000 being efficiently antiseptic for use as injections or dressings, and a solution of 1 in 250 being the usual strength for use against epizoa and in parasitic skin affections. It is a very active gastro-intestinal irritant, in toxic dose producing nausea, retching and vomiting, a metallic taste, constriction of the fauces, burning pain in the stomach, suppression of urine, bloody diarrhea, collapse and death often preceded by convulsions. It affects specifically the lower bowel [Calomel preferring the upper intestine], and produces inflammation and ulceration of the rectum. It is, however, one of the most manageable and efficient of the mercurials when used in proper doses.

The Subchloride (Calomel) is very insoluble and unirritating, tasteless, laxative in grain doses, decomposed by the alkaline contents of the intestines, oxide of mercury being formed, and acts especially on the excrementitious glandular appendages of the upper intestine, stimulating the liver by indirect reflex action as a duodenal purgative. In the presence of alkaline chlorides it is converted into the bichloride, but not in sufficient quantity to render it dangerous in the gastro-intestinal canal. Externally applied it is sedative to the mucous membranes and the skin. It is an efficient diuretic, in small doses frequently repeated. Ammoniated Mercury is an Ammonio-Chloride, and a useful stimulant and parasiticide when used locally in the form of ointment.

The Iodides are actively poisonous, the Red being much the most irritant. The Cyanide is also actively poisonous. The Yellow Subsulphate is a prompt and usually harmless emetic, but has occasionally produced fatal results by local irritant action. The Oxides are irritant, the Red being the most so, and are rarely used internally. The Acid Nitrate is a good escharotic, the pain caused by it being transient though severe, and its caustic action being comparatively superficial. The Ointment of the Nitrate (Citrine Ointment) is more irritant than that of ammoniated mercury, and generally needs dilution. All these preparations may produce the constitutional effects of mercury, and the subjects of their administration should be carefully watched for the first symptoms of mercurialization.

Antidotes and Incompatibles.

Albumin in some form, the white of one egg to gr. iv of the Bichloride, forms the albuminate, which must be at once evacuated by emesis or the stomach pump, as it is soluble in an excess of albumin or in the alkaline contents of the intestines.

The Chlorides are incompatible with very many agents, and the Bichloride should be administered in distilled water or pill by itself, being easily decomposed. Calomel is decomposed by alkaline iodides or bromides. The combination of Calomel with Hydrochloric Acid or Chlorides is apt to produce corrosive sublimate. In the "mixed treatment" of syphilis, a mercurial is combined in solution with Potassium Iodide, and the Red Iodide is the preparation usually selected, as the Bichloride is decomposed by potassium iodide. All trouble regarding incompatibility can be avoided by using sugar-of-milk triturations according to the general official formula therefor. In this form, says Piffard, "a larger proportion of the drug is utilized for specific purposes, while but a small amount remains to give rise to local irritation."

THERAPEUTICS.

Mercury is undoubtedly a specific in syphilis, but it is not applicable to the tertiary form of that disease. It is best administered in very small doses carefully watched and stopped just short of ptyalism, but renewed and so continued for a long time. Fumigation by Calomel volatilized by heat, or inunction by the Oleate or by Mercurial ointment may be used when the stomach will not bear any mercurial. The hypodermic method is also used, employing a solution of the Bichloride gr. j to ℥j each of glycerin and distilled water, of which the dose is ♏x once daily; or the [illegible] in solution with sodium chloride; or a cream made by mixing [illegible] ʒj, Lanolin ʒij, Oil (carbolized 2 per cent.) ʒj, the dose [illegible] x into the gluteal muscles once a week. The Yellow Iodide in doses of gr. $\frac{1}{10}$ to $\frac{1}{6}$ thrice daily with opium is the best preparation for internal use. Accuracy of diagnosis is an absolutely necessary preliminary to the administration of mercury, for where there is no syphilitic virus to be antagonized the constitutional effects of mercurials will become manifest sooner and may do great harm in feeble subjects, besides the risk of mistaking them for the results of the disease supposed to be present.

Tonsillitis, parotitis and other acute glandular inflammations of the throat and neck may often be rapidly cured by Calomel gr. $\frac{1}{20}$ or Gray Powder gr. $\frac{1}{6}$ every two hours. In irritable stomach with obstinate vomiting the same small doses of Calomel every half hour are very efficient. The dysentery of adults with slimy and bloody stools is best treated by small doses (gr. $\frac{1}{100}$) of the Bichloride, and in the diarrhea and dysentery (ileo-colitis) of infants Gray Powder gr. $\frac{1}{6}$ or Calomel gr. $\frac{1}{20}$ will be found very effective. In gastric ulcer and in the first stage of hepatic cirrhosis, the Bichloride in doses of gr. $\frac{1}{60}$ to $\frac{1}{80}$ thrice daily is a good remedy. Typhoid fever is treated in Germany by daily doses of Calomel, gr. x for three days, as an antipyretic. Diphtheria is by many practitioners considered to be best antagonized by Calomel in large doses, and in this affection the Cyanide has many advocates given in doses of gr. $\frac{1}{100-50}$ every hour, a weak solution being at the same time used as a gargle. Asiatic cholera is frequently treated by small, repeated doses of Calomel with opium from the start. Inflammations of sthenic character in the stage of exudation, especially when affecting serous membranes, are considered by many authorities to be best met by the free use of mercurials, but this treatment is fast going out of favor, excepting in cases of iritis, which affection is very often of syphilitic causation, and in pneumonia, which is frequently treated, according to the best American authorities, with sedative doses (gr. xv–xx) of Calomel.

In the general condition known as "biliousness," manifested by whitish or clay-colored stools, constipation, nausea, anorexia, coated tongue, slight jaundice, etc., mercurial purgatives have long been a routine remedy, but mild saline purgatives are by many authorities considered equally efficient. As an antiseptic to the gastro-enteric tract in many forms of stomach and intestinal disorders (dyspepsia septica) the administration of minute doses of the Yellow Oxide will be found remarkably efficient. It is best used in trituration with sugar of milk, 1 to 1,000, and in doses of gr. $\frac{1}{60}$–$\frac{1}{50}$. By the use of these small doses failing digestion and nutrition may almost certainly be improved.

In laryngeal diphtheria (membranous croup) the Subsulphate as an emetic is by many considered to have some specially beneficial influence.

Locally, an ointment of Calomel ʒj to ℥j of lard is an excellent antipruritic, and ointments of the Chlorides and Iodides are much used in skin diseases, particularly psoriasis, herpes, acne and pityriasis. In parasitic affections a lotion of the Bichloride, gr. ij to ℥j of distilled water, or a 5 per cent. Oleate with ⅙th part of ether, is very efficient. The Oleate is a serviceable application to syphilitic indurations, but is not deemed advisable when ulceration exists. In conjunctivitis Calomel may be used as a sedative application, or still better an ointment of the Yellow Oxide, gr. ij–x to ℥j of vaselin, triturated to the utmost fineness before mixing. Goitre and enlarged spleen are often speedily reduced by rubbing into the skin covering them the ointment of the Red Iodide somewhat diluted and applied before a hot fire or in the direct sunlight. The Acid Nitrate solution is one of the best caustics for destroying chancroid and syphilitic warts and vegetations. Black and Yellow Washes are used as applications to syphilitic erosions and ulcerated indurations.

As an antiseptic injection or application to dressings a solution of the Bichloride, gr. vijss in a quart of hot water ($\frac{1}{2000}$), is probably the most efficient that can be used, and still weaker solutions ($\frac{1}{5000}$) are sufficiently antiseptic for most purposes.

HYDRASTIS, Golden Seal,—the rhizome and roots of *Hydrastis canadensis*, a small plant of the nat. ord. Ranunculaceæ, growing in most parts of the U. S. It contains an unnamed Resin and 3 alkaloids, *Hydrastine*, $C_{21}H_{21}NO_6$, white and crystalline, soluble in alcohol, ether, etc., *Berberine*, $C_{20}H_{17}NO_4$, yellow crystals soluble in hot water and in alcohol, but not in ether, and *Xanthopuccine*, also yellow and crystalline. All these alkaloids unite with acids to form salts. From Hydrastine is prepared an oxidation product or artificial alkaloid, *Hydrastinine*, $C_{11}H_{11}NO_2$, the Hydrochlorate of which is official.

Preparations.

Extractum Hydrastis Fluidum, *Fluid Extract of Hydrastis.* Dose, ♏v–xxx.

Tinctura Hydrastis, *Tincture of Hydrastis,*—strength, 20 per cent. Dose, ʒss–ij.

Glyceritum Hydrastis, *Glycerite of Hydrastis,*—Hydrastis 2, in Glycerin 1, by percolation with Alcohol and Water. Used as a local application.

Hydrastininæ Hydrochloras, *Hydrastinine Hydrochlorate,* $C_{11}H_{11}NO,HCl$,—the hydrochlorate of an artificial alkaloid derived from Hydrastine. Light yellow, amorphous granules, deliquescent, very soluble in water, also in 3 of alcohol. Dose, gr. j in a ten per cent. solution, as a hypodermic injection.

Hydrastin (Unofficial),—an impure extract precipitated by Hydrochloric Acid from the alcoholic solution, consisting chiefly of Berberine Muriate. Dose, gr. ij–v.

PHYSIOLOGICAL ACTION.

Hydrastis is a simple bitter and a stomachic tonic. It promotes appetite and digestion and increases the secretions of the gastro-intestinal tract and the flow of bile, but if long used it will derange digestion and produce constipation. It is possessed of antiperiodic powers, and is a protoplasmic poison, arresting the movements of the white blood-corpuscles. By many observers it is also considered alterative to the mucous membranes, deobstruent to the glandular system, cholagogue, diuretic and antiseptic. The alkaloid Hydrastine produces effects on the nervous system somewhat similar to those caused by quinine, but seems to be devoid of toxic power, large doses only producing a sense of warmth in the epigastric region, and noises of a rushing character in the ears.

Incompatibles.

Tannic Acid, Hydrochloric Acid and the Alkalies are chemically incompatible with preparations of Hydrastis.

THERAPEUTICS.

Hydrastis is chiefly used as a stomachic tonic, an antiperiodic, a mild laxative and an antiseptic. Its alkaloid (Hydrastine) and extract (Hydrastin) are ranked high in the treatment of intermittents and chronic malaria, though much less efficient than quinine. It is an excellent remedy locally and internally in all forms of catarrh, especially that of the stomach, duodenum, gall-ducts, bladder, uterus and vagina. Internally it is efficient in many glandular swellings, in chronic constipation due to a sluggish state of the liver or deficiency of the other intestinal secretions, in chronic dyspepsia, and as a substitute for alcohol in dipsomaniacs when a catarrhal state of the stomach has been induced. In gonorrhea, gleet, and chronic nasal catarrh, it is locally employed with much benefit, also in syphilitic affections of the mouth, throat and nares. As a local alterative and antiseptic application it is highly recommended for unhealthy ulcers and sores, cancerous ulcerations, mercurial and aphthous stomatitis, rectal fissure, fistula and prolapse, internal and external hemorrhoids, cracks, fissures and abrasions of the nipples, erosion and ulceration of the cervix uteri, and in conjunctivitis with muco-purulent discharge. In gonorrhea a very efficient injection is an infusion of Hydrastis, ʒj of the powdered root to ℥viij of boiling water, or the fluid extract diluted in the proportion of ʒss or ʒj to the pint of water, but it should not be used until the acute stage has subsided.

Hydrastinine has long been known as a uterine vaso-constrictor, and as such has been successfully employed in metrorrhagia. It has been credited with powerful qualities as an antispasmodic, and also with action of decreasing the excitability of the cerebral cortex. It is considered preferable to Hydrastine on account of its stimulant action on the cardiac muscle, and the persistent constriction which it produces in the walls of the vessels. The Hydrochlorate is employed in grain doses hypodermically, using a ten per cent. solution ; the injections being best made, for menstrual irregularities, during a few days previous to the expected term. It has been used with great benefit in uterine hemorrhage and dysmenorrhea ; also in metritis, endometritis, myomata and pyo-salpingitis. It has been employed successfully in the treatment of hydrophobia, strychnine-poisoning and epilepsy, in the latter case having been given in doses of gr. ¼–½ up to gr. ij daily, and with benefit in four cases out of six.

HYDROCOTYLE, Pennywort (Unofficial),—is the leaf of *Hydrocotyle asiatica*, a small plant of the nat. ord. Umbelliferæ, a native of southern Africa and India. It contains a peculiar, oleaginous substance, *Vellarine*, which has a bitter, persistent taste, and is thought to be the active principle. It has long been used in its native countries as an alterative to purify the blood, and has been found of great service in eczema, lupus, psoriasis, syphilitic and scrofulous sores, and in leprosy. An ounce of the dried plant or leaves is given daily in infusion. It causes great itching over the whole body, ovarian pain in females, and urinary irritation. In one case in which the drug was being given for lupus of the hand a severe orchitis was set up without any other apparent cause. It certainly exerts a markedly special influence on the genito-urinary tract.

HYOSCYAMUS, Henbane,—the leaves and flowering tops, collected from plants of the second year's growth, of *Hyoscyamus niger*, a biennial plant of the order Solanaceæ, growing in Europe and the northern U. S. It contains an alkaloid, *Hyoscyamine*, $C_{17}H_{23}NO_3$, which is isomeric with Atropine and identical with Daturine and Duboisine, occurring as an oily liquid or in tufted crystals of silky lustre and yellow color, soluble in hot water, alcohol or ether. Another substance, *Hyoscine*, $C_{17}H_{21}NO_4$, is by some authorities considered a derivative of Hyoscyamine, by others a second alkaloid. It is semi-liquid, isomeric with Atropine, and yields *Tropic Acid* and *Pseudotropine*. Hyoscyamus leaves also contain a fatty Oil and much Potassium Nitrate, while from their destructive distillation is obtained an empyreumatic Oil which is a powerful narcotic. They are ovate, long and broad, glandular-hairy, with prominent midrib, heavy, narcotic odor, taste bitter and acrid.

An allied plant is *Scopolia carniolica*, also of the Solanaceæ, a common plant in the mountains of Bavaria and Hungary, which contains in the root an alkaloid, *Scopolamine* (or *Scopoleine*), $C_{17}H_{21}NO_4$, also found in small quantities in belladonna root, stramonium seeds and in duboisia. Nearly all the Hyoscine Hydrobromate supplied by manufacturing chemists consists of Scopolamine Hydrobromate (Schmidt). The two bases may be considered identical (Hesse).

Preparations.

Extractum Hyoscyami, *Extract of Hyoscyamus.* Dose, gr. j, when active.

Extractum Hyoscyami Fluidum, *Fluid Extract of Hyoscyamus.* Dose, ♏v–xx.

Tinctura Hyoscyami, *Tincture of Hyoscyamus,*—Strength 15 per cent. Dose, ʒj–iv; as a hypnotic ℥ss–j is necessary.

All the preparations of Hyoscyamus are uncertain in strength and activity, so that the effective dose of the extract formerly official ranged from 2 to 250 grains.

Hyoscyaminæ Sulphas, *Hyoscyamine Sulphate,* $(C_{17}H_{23}NO_3)_2H_2SO_4$,—small, yellow scales or crystals, deliquescent, of bitter taste, and very soluble in water and in alcohol. It varies much in purity of the base and consequently in activity. A grain of the commercial article, which was formerly very impure, has been given with impunity, but gr. $\frac{1}{10}$ of the pure alkaloid has produced violent poisoning. Dose, hypodermically, should not exceed gr. $\frac{1}{65}$; by the mouth gr. ¼–j may be given in urgent cases.

Hyoscyaminæ Hydrobromas, *Hyoscyamine Hydrobromate*, $C_{17}H_{23}NO_3HBr$,—a yellowish-white, amorphous mass, or prismatic crystals, of tobacco-like odor, and acrid, bitter, nauseous taste; deliquescent, soluble in $\frac{1}{3}$ of water and in 2 of alcohol. Dose, as the Sulphate. Hyoscyamine of good quality is difficult to procure and is very expensive, while Duboisine is easily obtained in any quantity, so that if these alkaloids prove to be physiologically as well as chemically identical, the latter will be used to the exclusion of the former.

Hyoscinæ Hydrobromas, *Hyoscine Hydrobromate*, $C_{17}N_{21}NO_4HBr + 3H_2O$,—colorless, transparent, rhombic crystals, odorless, of acrid, slightly bitter taste; soluble in 2 of water and in 13 of alcohol. Dose, gr. $\frac{1}{100}$–$\frac{1}{50}$ by mouth, gr. $\frac{1}{200}$–$\frac{1}{50}$ hypodermically. Nearly all the Hyoscine Hydrobromate furnished by manufacturing chemists consists of Scopolamine Hydrobromate.

PHYSIOLOGICAL ACTION.

Hyoscyamus has similar action to that of Belladonna, Duboisia and Stramonium, except that it is the least powerful and irritant of the group, but the most calmative and hypnotic. The delirium produced by it is never furious and is without hyperemia, but is accompanied by insomnia. It is more stimulant to the vaso-motor system and to the cardiac accelerator apparatus than is Stramonium, but is less active on the pneumogastric. It has decidedly laxative and carminative effects on the intestines and a very marked sedative influence on the urinary passages.

Hyoscyamine corresponds in action to the plant and its congeners, being considered by many authorities as almost identical with Atropine, but less powerful. No death has resulted directly from it. Except in very large doses it is more an anodyne or anesthetic than a narcotic or soporific. It is a mydriatic, excites the cerebral functions and depresses the spinal. Many observers deny that it possesses any soporific influence.

Hyoscine is a cerebral and spinal sedative, and a powerful hypnotic, directly depressing the higher functions of the brain, and affecting the heart but feebly. It is probably the action of this agent which prevents Hyoscyamus from causing the excitation and delirium of Belladonna. After the hypodermic administration of a full dose (gr. $\frac{1}{50}$), there is, in most subjects, a period of semi-maniacal delirium, with flushed face and dry mouth, lasting from one to two hours, and followed by the sedative action of the drug, during which the pulse-rate and frequency of respiration, at first quickened, are distinctly lowered. It especially affects the motor tract of the spinal cord and the cerebral cortex, slightly depresses the heart, but paralyzes respiration. It is free from irritant qualities and may be used hypodermically. Its habitual use brings on muscular paralysis and delirium of violent character. It is frequently used as a hypnotic by alcoholics and nervous subjects, and will probably ere long be responsible for many deaths. As a mydriatic its reputation is doubtful, some observers claiming greater power for it in this respect than that of Atropine, while others say that mydriasis may follow its use but is not always produced by even large doses. Severe toxic symptoms have followed the application of 4 drops of a 1 per cent. solution (equal to gr. $\frac{1}{25}$) to the ocular conjunctivæ. In large doses Hyoscine is a dangerous depressant of the respiration, but it may be used without unpleasant effects in medicinal doses. Whenever full doses are employed the respiration should be watched for several hours.

Dr. Balagopal, of India, has reported a case in which a man suffering from intermittent attacks of maniacal delirium was accidentally given gr. $\frac{1}{8}$ of the hydrobromate of hyoscine hypodermically. Severe toxic symptoms supervened, which were however antagonized by *Sulphuric Ether* administered subcutaneously. The patient recovered, and thereafter remained free from all mental or cerebral disorder.

Antagonists and Incompatibles.

These are the same as for Belladonna (see *ante*, page 215). Liquor Potassæ though incompatible is frequently prescribed in combination with Hyoscyamus. All the fixed caustic alkalies decompose its alkaloid, as also those of the allied plants.

THERAPEUTICS.

Hyoscyamus is a valuable though feeble narcotic and is chiefly used as a hypnotic and an anodyne when Opium is contraindicated, and for children. It is by far the best agent to use in acute mania with great motor excitement, obstinate insomnia and varied hallucinations. Chronic mania has been more benefited by it than by any other drug, and it is very efficient in insanity characterized by frequent delusions. In delirium tremens and the delirium of fevers it is an excellent hypnotic, and the monomania of hypochondriacs is alleviated and often cured by it. Whooping-cough, nervous coughs, and especially a dry, tickling night-cough, are greatly alleviated by full doses of Hyoscyamus. It is also efficient in colic of various forms, to palliate the trembling of paralysis agitans and mercurial tremor, and to relieve the pains and disordered coördination of locomotor ataxia. In constipation it is a good remedy, the extract being much employed in combination with other purgatives to render them more efficient and less drastic, but the quantity generally used is too small to be of any particular benefit. The tincture is an efficient remedy in irritability of the bladder from any cause.

Hyoscyamine may be used for the same purposes as Atropine, but being liable to considerable variation in purity and activity, it is not a popular agent with the profession.

Hyoscine has been frequently used in neuralgia, whooping-cough, acute mania, insomnia from cerebral excitement, delirium tremens, asthma and enteralgia, also in ophthalmic practice as a mydriatic. The Hydrobromate is the salt in general use, in doses of gr. $\frac{1}{100}$ hypodermically, gr. $\frac{1}{70}$ by the mouth. It efficiently, but temporarily, controls the tremor of paralysis agitans, and is highly useful at times in the treatment of the morphine-habit, especially for the extreme restlessness and insomnia resulting from the final withdrawal of that drug. In such cases, however, it must be used only in emergencies and should not be given habitually, as it excites a high degree of delirium in most subjects at first, followed after about 2 hours by its secondary sedative influence. Excessively or carelessly employed in such cases, it is liable to seriously derange the mental faculties in the same manner as Atropine, and is probably responsible for many of the impaired intellects which emerge from the so-called "Bichloride of Gold Cures" for alcoholism.

Dr. Lionel Weatherly warns the uninitiated against mistaking Hyoscine for Hyoscyamine, as these two alkaloids have very different characteristics clinically. He believes strongly in the power of Hyoscine as a mental alterative, and has found it to be particularly useful in that form of mental disturbance which renders the patient violent and abusive, restless and domineering—a nuisance to every one who has anything to do with him. Under the administration of repeated small doses of hyoscine such a patient becomes a changed man. Violence and abusiveness give place to an amiable politeness, and instead of indulging himself in the free exercise of an extensive, if somewhat shady vocabulary, the patient subsides into silence.

IGNATIA, St. Ignatius' Bean (Unofficial),—is the seed of *Strychnos Ignatii*, a small tree of the nat. ord. Loganiaceæ, native in the Philippine Islands, and also called *Ignatia Amara*. It contains the alkaloids *Strychnine* and *Brucine*, about 1 per cent. of each, for a description of which see under the title Nux Vomica.

Tinctura Ignatiæ, *Tincture of Ignatia* (Unofficial),—strength 10 per cent. Dose, ♏ij–x.

Physiological Action and Therapeutics.

Ignatia closely resembles Nux Vomica in action, a poisonous dose producing the same exaltation of the spinal functions, with muscular twitching, tetanic spasms, and death by asphyxia through tetanic fixation of the respiratory muscles, but as it contains a greater quantity of Strychnine than the latter it is more powerful in the same dose. It exalts the susceptibility of the sensory nerves and the nerves of special sense for a time, but an opposite condition soon succeeds, manifested by numbness and torpor with great mental depression. It causes a feeling of constriction about the throat and a sensation of anguish at the pit of the stomach. Its antagonists and incompatibles are the same as those for nux vomica.

Ignatia is recommended in hysteria to control the general hyperesthesia, also for insomnia, clavus hystericus, mental excitement or depression, aphonia, perverted appetite, and convulsive crying or laughing. It will often remove the intercostal neuralgia of hysterical subjects, and the sensation as of a ball rising to the throat (globus hystericus). Cerebrospinal irritability is diminished by small doses though excited by large ones, Ignatia being probably the most efficient controller of functional phenomena of the cerebro-spinal axis. In the convulsions of children from intestinal irritation without cerebral congestion, and in insomnia from nervous erethism, small doses of Ignatia are used with the happiest results. It is by many practitioners preferred to nux vomica as a stomachic tonic, and is useful in the treatment of dyspepsia, hypochondriasis and various nervous affections.

ILLICIUM, Star Anise,—is the fruit of *Illicium verum*, an Asiatic shrub of the nat. ord. Magnoliaceæ. It contains a *Volatile Oil* which is chemically and practically identical with the Oil of Anise. Another species, *Illicium anisatum* (*Illicium religiosum*), is very poisonous, causing vomiting, epileptiform convulsions, dilated pupils and cyanosed countenance. Its carpels are more woody, shrivelled and wrinkled, and end in a curved beak. Illicium is recognized officially as a source of the Oil of Anise, and has actions and uses similar to those of Anisum. (See *ante*, page 167.)

INULA, Elecampane,—is the root of *Inula Helenium*, a plant of the nat. ord. Compositæ, growing in Europe and N. America. It contains a volatile oil, a resin, a crystalline substance named *Helenin*, C_6H_8O, and a peculiar principle resembling starch, *Inulin*, $C_6H_{10}O_5$, which is found in Arnica, Taraxacum and other plants. Having the same chemical composition as starch, Inulin differs from the latter in being colored yellow by Iodine, and depositing from its solution in hot water as the solution cools. It is contained in Elecampane in large quantity, from 19 to 44 per cent., the latter in the autumn. There are no official preparations, but a decoction (℥ss to Oj) may be given in doses of ℥j–ij. Dose of the powdered root, gr. xx–ʒj.

Inula is a gentle stimulant to the secretory organs, and is said to be expectorant, diaphoretic and diuretic. In large doses it causes nausea and vomiting. It was formerly supposed to be emmenagogue and was much used in amenorrhea. It is now chiefly employed as a domestic remedy in chronic bronchitis and dyspepsia, and to promote the eruption in exanthematous fevers.

IODUM, Iodine, I,—is a non-metallic element, existing in sea-weed, sea-water, some fresh waters and fresh-water plants, also in sponge, oysters, eggs, cod-liver oil, rock salt and several ores. It occurs in bluish-black rhombic plates, of metallic lustre, peculiar odor, acrid taste and neutral reaction; sparingly soluble in water (1 in 5,000), readily so in ether, and in 10 of alcohol, also in a solution of potassium iodide or sodium chloride. It volatilizes slowly at ordinary temperatures, and produces a dark-blue color with gelatinized starch in a cold solution. Internally it is generally administered in the form of an iodide or as the compound solution of iodine. Dose, gr. ss–j.

Preparations of Iodine.

Tinctura Iodi, *Tincture of Iodine,*—strength 7 per cent. Dose, ♏j–v; but it is generally used as a local application, or for injection into cavities.

Liquor Iodi Compositus, *Compound Solution of Iodine, Lugol's Solution,*—has of Iodine 5, Potassium Iodide 10, in Distilled Water to 100. Dose, ♏j–x, well diluted.

Unguentum Iodi, *Ointment of Iodine,*—has of Iodine 4, Potassium Iodide 1, Water 2, Benzoinated Lard 93.

Iodized Phenol, *Carbolated Iodine* (Unofficial),—is a mixture of Iodine and crystallized Carbolic Acid in varying proportions, generally 1 of the former to 4 of the latter: for local use, especially in gynecology.

Iodides and their Preparations.

Ammonii Iodidum, *Ammonium Iodide,* NH_4I,—a deliquescent, granular, white salt; soluble in 1 of water and in 9 of alcohol at 59° F. Dose, gr. ij–x or more.

Potassii Iodidum, *Potassium Iodide*, KI,—a colorless, deliquescent, crystalline salt, of saline and bitter taste; soluble in 0.8 of water and in 18 of alcohol. ℥j of this salt dissolved in ℥j of water makes nearly ℥jss of fluid, so that ♏vijss of the solution would be required to obtain gr. v, a fact to be remembered in prescribing. Dose, gr. v–ʒj.

Unguentum Potassii Iodidi, *Ointment of Potassium Iodide*,—has of the Iodide 12, Sodium Hyposulphite 1, Hot Water 10, Benzoinated Lard 77.

Sodii Iodidum, *Sodium Iodide*, NaI,—minute, deliquescent crystals; soluble in 0.6 of water and in 1.8 of alcohol. Dose, gr. v–ʒj.

Strontii Iodidum, *Strontium Iodide*, $SrI_2(H_2O)_6$,—colorless, hexagonal plates, of bitter, saline taste; very soluble in water and in alcohol. Dose, gr. v–xxx.

Iodoformum, *Iodoform*, *Formyl Iodide*, CHI_3,—small, lemon-yellow crystals, of saffron-like and penetrating odor; very slightly soluble in water, soluble in about 52 of alcohol, 12 of boiling alcohol, and in 5.2 of ether; very soluble in chloroform, benzin and fixed and volatile oils. Its solutions have neutral reaction. Dose, gr. j–v.

To remove its odor without forming a compound the best agents are Thymol (gtt. ij ad ℥j of Iodoform), Oil of Mirbane (gtt. vj ad gr. xv), Oil of Bitter Almonds, or Oil of Rose (gtt. j ad ʒj). Oil of Turpentine is particularly serviceable in removing the odor from the hands, or from spatulas, mortars, etc.

Unguentum Iodoformi, *Iodoform Ointment*,—Iodoform, finely pulverized, 10, Benzoinated Lard 90, thoroughly mixed by trituration.

Other Iodides and preparations thereof are—Argenti Iodidum, Arseni Iodidum, Liquor Arseni et Hydrargyri Iodidum, Hydrargyri Iodidum Rubrum, Hydrargyri Iodidum Flavum, Syrupus Ferri Iodidi, Pilulæ Ferri Iodidi, Plumbi Iodidum, Sulphuris Iodidum and Zinci Iodidum. As these preparations are allied in action and uses less closely to Iodine than to the other elements in their composition, they are described under other titles. (See *Argentum Hydrargyrum*, etc.) Ethyl Iodide or Hydriodic Ether is described under Æther (see *ante*, page 113).

Preparation of Hydriodic Acid.

Syrupus Acidi Hydriodici, *Syrup of Hydriodic Acid*,—contains 1 per cent. of absolute Hydriodic Acid, HI. Dose, ʒj–iv, well diluted.

PHYSIOLOGICAL ACTION.

Iodine is irritant to the mucous membranes and to the skin. Applied to the latter it stains a deep yellowish-brown color and combines with the albumin of the tissue, causing considerable pain and subsequent exfoliation of the epidermis. Vesication may be quickly produced if the quantity used be large. Inhaled its vapor irritates the respiratory mucous membrane, producing sneezing, cough, dyspnea, also pain in the chest and in the frontal sinuses. In the gastro-intestinal canal it is equally irritant, but is gradually converted into the iodide or iodate of sodium, in which form or as an albuminate it is absorbed into the blood. Iodine decomposes organic molecules, and in the presence of phosphoretted or sulphuretted gases it acts like chlorine but more feebly, uniting with their hydrogen and thus breaking up those noxious compounds it is disinfectant and deodorant.

The Iodides of Sodium, Potassium, etc., are very diffusible and are as rapidly excreted; setting free nascent oxygen (Ozone) and Iodine at the points of elimination they are remotely irritant to the mucous membranes, causing violent coryza, with soreness of the throat, acute conjunctivitis, profuse mucous discharges, headache and irritation of the kidneys and the skin. Intravenous injections of these salts produce at first a rapid elevation of arterial pressure with acceleration of the cardiac rate; followed by slowing of the heart, and later on lowered blood-pressure with increased heart-rate. If used for any length of time they induce great waste and rapid elimination of waste products, causing anemia, emaciation and mental depression; but these effects are credited chiefly to the metallic constituent, being most severe from the potassium salt. They combine with certain poisons in the system, particularly lead, mercury and the products of the syphilitic disease, hastening their elimination. *Iodism* is the term applied to the general condition produced by these agents, and comprises the symptoms above noted together with frontal headache, ptyalism, a saline taste in the mouth, dysphagia, temporary impotence, and an acneform eruption on the face and limbs. Sometimes the eruption is furuncular or even purpuric. It is less apt to result from the use of the Strontium Iodide than from that of the others. The copious dilution of these preparations with water promotes their excretion, and to a great extent prevents the development of unpleasant results. The ptyalism occasionally produced by iodides is not a direct result of their action, and occurs only in persons who have previously taken mercurials. In such cases the mercury, which had been deposited in the tissues as an albuminate, is set free by the iodide and coming again into the circulation it produces its constitutional effects. (Murrell.)

Potassium Iodide occasionally gives rise to some peculiar symptoms in certain susceptible persons. Among these are diuresis, cerebral excitement as from alcohol, hemorrhages from the urethra and the vagina, glossitis (Gross), also laryngitis and sudden edema of the glottis. The latter may be of so intense a character as to require the instant performance of tracheotomy in order to avert death. On the circulation it produces marked and important effects in most cases. It causes acceleration of the pulse and vascular dilatation, leading to abundant secretion from several glands. It reduces the temperature a degree or more, and slows the rate of the respiration.

Iodoform contains from 94 to 97 per cent. of Iodine and naturally resembles the latter in action. Locally its action is anesthetic and powerfully antiseptic. It is one of the best agents to prevent decomposition and to destroy the germs of putrefaction and of disease, but must be carefully employed, as when used in quantity on an extensive raw surface it has often produced fatal results with symptoms of narcotic poisoning. The first sign of its dangerous absorption is increase of temperature, which may reach 104° or more, then headache, quick and feeble pulse, marked anxiety and restlessness. Collapse and death may suddenly supervene. The quantities which have produced fatal results from local absorption have varied from 525 to 4,500 grains. In small doses internally it is considered to be a tonic and alterative, wasting does not occur, but the body-weight increases and the general condition improves. In these respects its action markedly differs from that of Iodine or the Iodides. In medicinal doses internally administered for any length of time it may cause profuse salivation.

Ethyl Iodide (see *ante*, pages 113 and 116) is used by inhalation to bring the system rapidly under the influence of Iodine. It is a good antispasmodic and general stimulant and a very slow anesthetic.

Antidotes, Antagonists and Incompatibles.

Starch is the antidote to free Iodine, but the stomach must be evacuated soon as the resulting iodide is active. *Albumin*, starch, lime-water, tannin and soap may be used in poisoning by the iodides, and free emesis should be induced. In chronic iodide poisoning a free salivary flow, brought on by chewing *Pyrethrum* root, will hasten elimination of the drug. Restoratives and vaso-motor tonics, as *Quinine*, Digitalis, etc., are therapeutically antagonistic.

Incompatibles with Iodine and the Iodides are the Mineral Acids, Metallic Salts, Alkaloids and their salts, also Ammonia. Potassium Iodide combined in solution with Potassium Chlorate results in a poisonous compound. As Potassium Iodide decomposes nearly all the metallic salts, and is incompatible with many substances, it is best prescribed alone or in some simple vehicle, a favorite one being the Compound Syrup of Sarsaparilla. It may be prescribed with *Tincture of Cinchona*, an ounce of which dissolves 30 grains, or in combination with *Liquor Potassii Arsenitis*, which prevents the iodic eruption to some extent. In the "mixed treatment" of syphilis it is combined with *Biniodide of Mercury*. It is better borne when combined with *Nux Vomica* or Potassium Acetate, or alternately with Iodide of Iron (Squire). Its efficacy is increased by uniting it with *Ammonium Carbonate*, 2 parts to 1 or 1½ of the Iodide (Gull).

THERAPEUTICS OF IODINE.

The tincture and the compound solution are much employed locally as counterirritants and by injection into cavities as alterative applications, instances of which are their use in glandular tumors, hypertrophied tonsils, cervical and ovarian cysts, empyema, hydrocele, etc. In various skin diseases, as chloasma, lentigo, lupus, the tincture or a glycerite is well applied, and in many splenic and hepatic disorders of chronic type the ointment or tincture is a favorite counterirritant application. In sores, ulcers, and fissures, the Iodide of Starch or a mixture of Iodoform and Tannin are strongly recommended, and the tincture is much used locally to promote absorption of the products of acute inflammations. In acute catarrh and hay-fever inhalations of Iodine-vapor or that from Iodized Phenol are very serviceable, and in the vomiting of pregnancy 1- to 5-drop doses of the tincture every hour are often efficient. The compound solution well diluted is given thrice daily in typhoid fever with good results in many cases, and in malarial fevers the same preparation combined with Carbolic Acid has shown curative power. In strumous conditions Iodine internally is generally considered to be more efficient than any of the Iodides.

THERAPEUTICS OF THE IODIDES.

Potassium Iodide is the most frequently used iodide, and is the form in which Iodine is generally administered internally. It is usually given in simple solution or in the compound infusion or syrup of Sarsaparilla. Though its mode of action has never been explained satisfactorily, it is known by clinical experience to counteract many pathological conditions, to promote the absorption of morbid products, and the elimination of several metallic poisons. It is almost of specific rank in tertiary syphilis and its results, as neuralgiæ, paralyses from gummata, ulcerations, syphiloma of the internal viscera, lupus, chronic rheumatism and sciatica, in all of which when of syphilitic origin this iodide in large doses (50 to 150 grains daily) to saturation of the system will speedily cause improvement. So also in mercurial poisoning and other chronic metallic toxemiæ, the best treatment is by rapid saturation with Potassium Iodide. The products left behind by pneumonia, pleurisy and pericarditis often yield to moderate doses (5 grains), which if used for a prolonged period seem to retard the changes of chronic nephritis. It is the best remedy for the early stage of hepatic cirrhosis, and acts as a most efficient expectorant in chronic bronchitis. Aneurisms are often cured by large doses (20 to 30 grains) of Potassium Iodide, the sac becoming solid by fibrinous deposit. In acute catarrh and hay-fever, it is useful with Arsenic, the Iodized Phenol being at the same time used locally in weak solution. In tonsillitis and simple sore throat a weak solution (gr. ij–v to the ℥) is a good gargle, and in large doses it is often efficient in spasmodic asthma induced by bronchial catarrh.

Ammonium Iodide in grain dose repeated frequently is an excellent remedy in acute catarrh, hay-fever, duodenal catarrh and its accompanying jaundice, in chronic and capillary bronchitis, and in catarrhal pneumonia to prevent caseation of the products. In the first stage of hepatic cirrhosis and in chronic malarial poisoning it is equally efficient administered in conjunction with arsenic. Being somewhat more irritating than the other iodides it is usually given in smaller quantity, but being less stable it is more energetic in action.

Sodium Iodide may be used instead of the potassium salt, in all affections in which the latter is indicated; but requires to be administered in somewhat larger doses, being less active and less toxic. Strontium Iodide is still less liable to produce eruptions, and has been employed with benefit in scrofulous, rheumatoid and cardiac disorders. It is said to be free from causing intestinal irritation or depression of nutrition.

Hydriodic Acid is used as a substitute for iodine and the iodides. As an alterative it is believed by some to possess all the powers of iodine while it is much less offensive to the taste and the stomach. It has been used with benefit in asthma and bronchitis. This acid is not now official, as it is liable to change by the development of free iodine.

Iodoform is chiefly employed in local diseases as an antiseptic, anesthetic and alterative agent. It may be dusted in fine powder over a wound or sore, or used in ethereal solution to saturate gauze or absorbent cotton. It is a useful application to sloughing and phagedenic ulcers, gunshot wounds, chancroids, fistulæ, sinuses and painful affections of the rectum or uterus. Internally it may be used as a general tonic and alterative in syphilis and other cachexiæ, also for neuralgia, and is frequently prescribed with Iron. Triturated with tannin it forms a good application to the cervix uteri in erosions and ulcerations thereof, or an Iodo-tannin may be prepared by saturating the tincture of iodine with tannic acid, and applied on a cotton tent to the uterine mucous membrane in many chronic affections of that organ. Tuberculosis has been successfully treated by Iodoform, which checks the activity of the bacillus of that disease. Diabetes has been apparently cured by Iodoform, and syphilis may be combated successfully thereby in lieu of potassium iodide.

Unofficial Substitutes for Iodoform.

Aristol, *Dithymol Iodide*,—is a combination of Iodine and Thymol, containing nearly 46 per cent. of the former, and is prepared by adding an alkaline solution of Thymol to a solution of Potassium Iodide and Iodine. It occurs as an amorphous, odorless, unstable, non-toxic powder, of a brown-red or fawn color, insoluble in water or glycerin, sparingly soluble in alcohol, freely so in ether, chloroform, and fatty oils. As its Iodine leaves it readily, no heat should be used in dispensing it, and it should not be mixed with alkalies, metallic oxides, or starch. It is used locally as a substitute for Iodoform.

Aristol is highly praised by those who have used it in the local treatment of ulcers, wounds, and other breaches of the tissues; in which it is considered nearly, if not quite, as efficient as Iodoform, with the great advantage of being odorless. Excellent results have been obtained with it in the treatment of indolent soft ulcers, lupus, psoriasis, syphilitic ulcerative processes, eczema, severe burns, affections of the ear, nose, and pharynx, as well as in the various cases in gynecological and dermatological practice in which Iodoform has hitherto stood supreme. Its prolonged use may give rise to chronic iodine poisoning. Aristol is best applied in powder, in solutions in Oil or Ether (5 to 10 per cent.), or as ointments with a base of Lanolin or Vaselin (5 to 10 per cent.). A useful application is a liniment, prepared by dissolving 5 grains of Aristol in ʒij of a mixture of equal parts of Ether and Alcohol, then incorporating ℥j of soft Soap.

Europhen, *Isobutyl-orthocresol Iodide*,—is produced by the action of Iodine upon Isobutyl-orthocresol in a solution of Potassium Iodide, and contains about 27 per cent. of Iodine, which it gives up to metallic oxides and mercury salts, and when brought into contact with aqueous liquids. It occurs as a very fine, amorphous, yellow powder, of faint aromatic odor like that of saffron; insoluble in water and in glycerin, soluble in alcohol, ether, chloroform and fatty oils; readily decomposed by heat and by starch, slowly by light. It is five times lighter and more bulky than Iodoform, and is used as a substitute therefor in all local applications where a dry antiseptic is required. Like Aristol, it should be kept in a dry place, and protected from the action of light. Its virtues are probably due to the readiness with which it liberates free, nascent Iodine, when in contact with aqueous liquids; being fully equal in this respect to Iodoform. Used externally, it is dusted on in powder, or applied as a 5 to 10 per cent. ointment with Lanolin as a base. It must not be combined with metallic oxides or mercurials, nor with zinc starch paste. For hypodermic use a 3 to 10 per cent. solution in Olive Oil is employed. A mixture of Europhen and Aristol, equal parts of each, is highly recommended for adhesiveness.

Bismuthi Subiodidum, *Bismuth Subiodide,* BiOI,—is a heavy, amorphous, brick-red powder, insoluble in any reagent without decomposition.

Bismuthi Subgallas, *Bismuth Subgallate* (*Dermatol*),—is a very fine saffron-yellow-odorless powder.

These are two of the very best among the agents proposed as substitutes for Iodoform in local applications. They are non-irritant, powerfully bactericidal, and entirely odorless. In the author's experience the Subiodide is exceedingly efficient in stimulating the growth of granulations in a large wound, such as that often necessary in the surgical treatment of fistula in ano. They are described under BISMUTH (*ante,* page 220).

Iodomuth,—is a proprietary bismuth preparation, said to contain 25 per cent. of Iodine. It is described on page 219.

Iodol, *Tetra-iodo-pyrrol,*—is obtained by treating *Pyrrol,* (a coal-tar product), with a solution of Iodine and Potassium Iodide, usually known as Potassium Iodo-iodide solution. It occurs in very long, minute, delicate, prismatic crystals, of a yellowish tint, sparingly soluble in water, but readily in alcohol. When even slight decomposition is going on the crystals take on a brown tinge, due to the free iodine. Its odor is very slight, it being practically odorless when pure; and, unlike Iodoform, it has no toxic properties when undecomposed. It contains about 89 per cent. of Iodine. Dose, gr. ss–v, in tablet. Though practically insoluble in water, Iodol dissolves readily in the gastric juice, and is rapidly absorbed and as quickly diffused throughout the system. It has the same general action as Iodoform, except that it is devoid of toxic power.

Iodol is a very close rival to Iodoform, and is used in almost every instance where the latter agent is applicable (Squibb). It should replace Iodoform largely as a topical application, on account of its freedom from unpleasant odor. Internally it is highly esteemed as a remedy in chronic gastric catarrh, intestinal catarrh, and in ulceration of the gastro-intestinal mucous membrane. It has been found to be highly useful in bronchitis, bronchial catarrh, and in various respiratory neuroses; and has seemed to render good service in the treatment of tuberculosis and syphilis. In eczema of the ear Iodol has proved very efficient. Under its use the inflammation disappears generally within two weeks, but irrigation should be kept up for a short time afterwards, in order to complete the treatment. (Chatellier.)

Nosophen, *Iodophen,*—is a patented preparation, chemically entitled Tetra-iodo-phenol-phthalein, and obtained by the action of iodine on a solution of phenol-phthalein. It contains 60 per cent. of Iodine and occurs as a yellow, insoluble powder, of feebly acid character, with alkalies forming soluble salts, the sodium salt being of blue color and named *Antinosin.* Nosophen is highly germicidal and is used as an antiseptic dusting powder for wounds, ulcers, etc., also internally for catarrhal inflammations of the gastro-intestinal tract. Dose, gr. v–viij.

IPECACUANHA, Ipecac,—is the root of *Cephaëlis Ipecacuanha,* a small shrubby plant of the nat. ord. Rubiaceæ, growing in Brazil and Columbia. It contains *Cephaëline,* $C_{14}H_{19}NO_2$, which is a crystalline alkaloid; *Emetine,* $C_{14}H_{18}(CH_3)NO_2$, an amorphous alkaloid and a methyl compound of cephaëline; also a third alkaloid in very small quantity, a glucoside named *Ipecacuanhic Acid,* starch, gum and a trace of a volatile oil. Dose of the powdered root, as an expectorant gr. ss–ij, as an emetic gr. xv–xxx.

Official Preparations.

Extractum Ipecacuanhæ Fluidum, *Fluid Extract of Ipecac,*—Dose, ♏j–v–xx.

Syrupus Ipecacuanhæ, *Syrup of Ipecac,*—strength 7 per cent. Dose, ʒj–iv.

Vinum Ipecacuanhæ, *Wine of Ipecac,*—strength 10 per cent. Dose, ♏j–ʒj.

Pulvis Ipecacuanhæ et Opii, *Powder of Ipecac and Opium, Dover's Powder* (*Pulvis Doveri*),—has of Ipecac 10, Powdered Opium 10, Sugar of Milk 80, triturated together to a fine powder. Dose, gr. ij–xv or xx.

Tinctura Ipecacuanhæ et Opii, *Tincture of Ipecac and Opium*,—has of Tincture of Deodorized Opium 100 evaporated to 80, Fluid Extract of Ipecac 10, Diluted Alcohol to 100. Is a fluid representative of Dover's powder. Dose, ♏ij–xx or xxx.

Trochisci Ipecacuanhæ, *Troches of Ipecac*,—each troche contains of Ipecac about gr. $\frac{1}{3}$. Dose, j–iij.

Trochisci Morphinæ et Ipecacuanhæ, *Troches of Morphine and Ipecac*,—each troche contains about gr. $\frac{1}{40}$ of Morphine Sulphate, about gr. $\frac{1}{12}$ of Ipecac, with Oil of Gaultheria, Sugar, etc. Dose, j–iij.

Unofficial Preparations.

Ipecacuanha De-emetinisata, *De-emetinized Ipecac*,—is Ipecacuanha deprived of its alkaloids, for use in dysentery. Dose, gr. v–xx.

Emetina, *Emetine*,—colorless, amorphous, soluble in alcohol, ether, chloroform and benzin, very sparingly in water, insoluble in caustic alkalies. Its salts are readily soluble in water, the Hydrochloride and Hydrobromide being those chiefly used in medicine. It is powerfully toxic in large doses. Dose, as an expectorant, gr. $\frac{1}{120}$–$\frac{1}{40}$, as an emetic, gr. $\frac{1}{8}$–$\frac{1}{4}$.

Emetinæ Hydrobromas, *Emetine Hydrobromate*,—crystalline in silky tufts of needles, readily soluble in water, contains 68 per cent. of the alkaloid. Dose, gr. $\frac{1}{60}$–$\frac{1}{20}$.

Cephaëlinæ Hydrochloras, *Cephaëline Hydrochloride*,—is readily soluble in water. Cephaëline is more powerfully emetic than Emetine, but does not produce depressing effects in doses of gr. $\frac{1}{12}$–$\frac{1}{6}$ and is slow of action.

PHYSIOLOGICAL ACTION.

Ipecac is nauseant, emetic, expectorant, cholagogue, diaphoretic, hemostatic, sternutatory, and irritant. Applied to the skin it produces redness, itching and occasionally a pustular eruption; injected subcutaneously it causes pain and inflammation often terminating in abscess. Used as snuff it excites violent sneezing and profuse mucous secretion; in some persons the inhalation of the smallest quantity induces an asthmatic paroxysm, with swelling and injection of the conjunctival and nasal mucous membranes, salivation, tears, sneezing, coughing and bronchial catarrh. Its action on the gastro-intestinal mucous membrane is also decidedly irritant. Internally, small doses (gr. $\frac{1}{8}$–$\frac{1}{4}$) act as a stomachic and hepatic tonic and increase the gastric secretions; larger doses (gr. v–xx) are nauseant and emetic in from 20 minutes to half an hour, but the emesis produced is not violent nor is it followed by much depression. If these doses are repeated a tolerance of the stomach to the drug becomes established and a cathartic action is produced, the stools having a peculiar bilious character. The circulation is only slightly affected by Ipecac, but it relaxes the skin and increases the broncho-pulmonary mucus. In large doses it is decidedly irritant to the intestinal canal, but here also it is capable of the same tolerance as in the stomach. In poisonous doses it has frequently produced hemoptysis and other hemorrhages. Rutherford found it to be a powerful hepatic stimulant. Woodhull believes that it is a direct nervous stimulant, acting chiefly, if not entirely, upon the sympathetic system.

Emetine possesses strong constringent action on the blood-vessels and is powerfully emetic and expectorant. It causes death in animals by cardiac paralysis, and the autopsies show evidence of gastro-intestinal irritation and hyperemic lungs with patches of hepatization.

Antagonists and Incompatibles.

Narcotics generally antagonize the emetic action, so also do *Bismuth*, Carbolic and Hydrocyanic Acids. The salts of Lead and Mercury, Vegetable Acids and astringent infusions are incompatible with Ipecac.

THERAPEUTICS.

Ipecac is much used as an emetic, being safe, efficient and non-depressant, though slow of action. It is the best agent of the kind to relieve the stomach in acute indigestion and bilious sick-headache, and an ipecac-vomit is considered by many good practitioners to be very serviceable at the commencement of eruptive, continued and periodical fevers. The syrup is a favorite domestic emetic to cut short an attack of spasmodic croup, and it may be used beneficially in laryngismus stridulus and in capillary bronchitis. In small doses Ipecac is an excellent stimulant of the gastric and hepatic functions, and an expectorant of great value. In atonic dyspepsia, catarrhal jaundice, intestinal colic, bronchial asthma, hay fever, bronchial catarrh, acute laryngitis and pharyngitis, also in nervous and other coughs, it has rendered good service. In still smaller doses (♏j of the wine) frequently repeated it is an efficient anti-emetic in vomiting of nervous origin, and especially in the vomiting of pregnancy, also in that of gastric atony as seen in chronic alcoholism; its action in this affection being due perhaps to its possessing a sedative influence upon the pneumogastric in small doses. It is an excellent remedy in hemoptysis if given in small and frequently repeated doses until nausea occurs. As an antihemorrhagic it has been efficiently used in epistaxis, menorrhagia and post-partum hemorrhage, in the latter affection being given in combination with Ergot. In doses of a grain several times a day it has given satisfaction in cases of idiopathic neuralgia, hyperidrosis, intermittent fever, erysipelas, acute and suppurative hepatitis and opium narcosis, also in many of the affections which frequently complicate the puerperal state.

In acute intestinal affections Ipecac has achieved its greatest reputation as a remedy, one of its oldest titles being *radix antidysenterica*. Its power over acute dysentery was known to Piso and Helvetius in the 17th century, and was mentioned by Balmain (1797), Playfair (1813), Twining (1831) and Delioux (1851). The reports thereon by Docker (1858) attracted general attention, and since the latter date it has been universally recognized as a specific remedy for acute tropical dysentery and that malarious districts. Under large doses, 20 to 60 grains every four urs, the tormina and tenesmus disappear, the character of the stools improves and the constitutional symptoms are relieved. Such doses are not necessarily emetic in all persons, especially if administered in the powder, with a very small quantity of water, preceded by a full dose of opium or a hypodermic injection of morphine and followed by a mustard plaster applied to the epigastrium and perfect quiet in the recumbent posture. De-emetinized Ipecac is said to be as efficient as the unaltered drug in this disease, while nearly free from nauseant and emetic action. Chronic dysentery may also be benefited by this treatment, though some physicians prefer to use smaller doses for a prolonged time in this affection. Diarrheas of simple but painful form, especially the summer diarrhea of young children and that of teething infants, are often greatly relieved by Ipecac in doses of 1 to 5 grains, the bilious character being thereby restored to the discharges and a healthy stimulation of the alimentary mucosæ produced. Cholera morbus and cholera infantum have frequently been cured by this remedy, the action of which, in these affections and in dysentery, is most probably that of a sympathetic nerve stimulant, restoring the nervous tone of the intestinal mucous membrane (Woodhull). After 50 years' experience in the use of Ipecac, Dr. Higginbottam (1868) stated that "its main efficacy is in stimulating and restoring the normal action of the capillary system." The non-emetic use of this drug, so ably advocated by Woodhull, is not merely a method but a principle, and means the use of the remedy, regardless of dose, so as to develop its stimulant rather than its emetic power.

Ipecac is said to be destructive to the bacillus of anthrax though not to its spores. As the latter are not present in malignant pustule, this drug may prove efficient therein and success has followed its employment. It is used locally after excision of the pustule, also internally in moderate doses.

IRIS, Blue Flag,—is the rhizome and roots of ***Iris versicolor***, an indigenous plant of the nat. ord. Irideæ, growing in moist meadows and on the borders of swamps, having large blue flowers. It contains tannin, sugar, starch, gum, an acrid resin, fixed oils and traces of an alkaloid. Dose of the powdered root, gr. v–xx.

Preparations.

Extractum Iridis, *Extract of Iris.*—Dose, gr. j–v.

Extractum Iridis Fluidum, *Fluid Extract of Iris.*—Dose, ♏v–ʒj.

Iridin or **Irisin** (Unofficial),—is a so-called resinoid found in the shops, of undetermined composition, but probably an oleoresin precipitated by water from an alcoholic preparation. Dose, gr. j–v.

Iris when fresh is actively purgative, emetic and diuretic, producing severe nausea and prostration. Iridin has been the subject of experimentation upon dogs, and is shown to be a powerful hepatic stimulant with considerable influence on the intestinal glands, being more purgative than Euonymin and less irritant than Podophyllin. In very small doses it causes obstinate constipation by producing rectal inactivity.

Iris is very serviceable in duodenal catarrh with obstruction of the bile-ducts and consequent jaundice, also in malarial poisoning, bilious remittents, and jaundice of malarial origin. It is used in many hepatic and intestinal disorders as a cholagogue and purgative of mild but efficient action, also as a diuretic in dropsies. In small doses (♏j of a tincture) it is strongly recommended in a peculiar blinding headache in the right supraorbital region with nausea or vomiting, supposed to be of hepatic origin.

JALAPA, Jalap,—is the tuberous root of *Ipomœa Jalapa*, a Mexican plant of the nat. ord. Convolvulaceæ. It contains 15 to 20 per cent. of the official Resin, which is composed of two glucosides, *Jalapin*, soft, soluble in ether, and *Convolvulin*, $C_{31}H_{50}O_{16}$, which is hard, insoluble in ether, and the most active of the two. Dose, gr. v–xx.

Preparations.

Extractum Jalapæ, *Extract of Jalap.*—Dose, gr. ij–x. Is an ingredient of Pil. Catharticæ Co., and Pil. Catharticæ Vegetabiles.

Resina Jalapæ, *Resin of Jalap,*—prepared from a tincture by precipitation by water. Is insoluble in water, soluble in alcohol. Dose, gr. ij–x.

Pulvis Jalapæ Compositus, *Compound Powder of Jalap*, (*Pulvis Purgans*),—has of Jalap 35, Potassium Bitartrate 65, rubbed together until thoroughly mixed. Dose, gr. x–ʒj.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Jalap is an active cathartic, producing copious and watery stools, with considerable tormina and tenesmus, also sometimes nausea. It does not produce hemorrhoids, but does increase the secretions of the intestinal canal and the flow of bile. Its action is not due to any one of the contained principles, but all the active constituents are found in the resin. Compared with other agents of the same class its action most nearly resembles that of Scammony. It is more drastic than Senna and less irritant than Gamboge, but in overdoses may produce dangerous hypercatharsis.

Convolvulin in sufficient dose is an active irritant poison, producing gastro-enteritis and narcotism. Its action as a purgative seems to be wholly local, as from its intravenous injection no catharsis results, yet it exerts little if any irritant action on the conjunctiva, nasal mucous membrane or skin. It is not eliminated in the urine or the feces, and is therefore probably destroyed in the system by oxidation.

In olden bowel-moving times Jalap and Calomel were used together in doses of gr. x each (" ten and ten "), as a routine purgative prescription.

Less ponderous doses are now considered equally efficient, and one grain of each agent with the same quantity of extract of Hyoscyamus as a corrective may be used with advantage at the onset of fevers with inflammations. As the compound powder it is much employed to produce free watery evacuations in ascites and anasarca. Being nearly tasteless it is a useful cathartic for children, and may be administered in syrup of Rhubarb (gr. ij–v in ℥ss). As a vermifuge it is efficient as an adjunct to more powerful agents, and is employed with Calomel and Santonin for the expulsion of lumbrici. Jalap is contraindicated in all inflammatory conditions of the intestinal mucous membrane, but in proper doses it is one of the most manageable and efficient cathartics.

JAMBUL, Jamun (Unofficial),—the seeds and bark of the *Eugenia Jambolana*, a native tree of India, has a very varied history of successes and failures in the treatment of diabetes. The British Medical Association has directed its Committee on Therapeutics to investigate the claims made for and against this agent, so that some reliable information may be expected concerning this very important question. One writer contends that any efficient preparation should be made from the fresh seeds, discarding the pericarps, and avoiding the application of heat; also that a weak alcoholic menstruum exhausts the drug and gives a stable preparation. Dose of a fluid extract, ♏v–xv.

Reports, from observers abroad and in this country, show that favorable results have been obtained with Jambul in many cases of diabetes, even after the unsuccessful use of all the usual remedies. In two severe cases, in which 7 and 3 per cent. respectively of glucose was excreted, the urine was brought back to normal and kept there for two years, by the use of this remedy. It should be given with or after meals, in water or wine sweetened with a small quantity of saccharin, and accompanied by general treatment.

JUGLANS, Butternut,—is the bark of the root, collected in autumn, of *Juglans cinerea*, the Butternut or White Walnut, an indigenous forest tree of the nat. ord. Juglandaceæ. It contains an orange-yellow, crystalline and acrid substance named *Juglandic Acid* or *Nucin*, resembling Chrysophanic Acid, also some resin, volatile acid, etc., but neither tannin nor any alkaloid.

Extractum Juglandis, *Extract of Juglans.*—Dose, gr. v–xx or more.

Juglans is a mild cathartic operating without the production of pain or irritant symptoms. It is never used in substance, but the extract is a good laxative in doses of gr. v–x, and a purgative in larger doses. It has considerable reputation in dysentery and chronic constipation.

JUNIPERUS, Juniper,—the source of the official Oleum Juniperi, is the fruit of *Juniperis communis*, an evergreen shrub of the nat. ord. Coniferæ, growing in Europe and N. America. It contains a *Volatile Oil*, which consists of terpenes and camphors in complex combination, also a non-crystallizable principle named *Juniperin*, and grape sugar, resin, formic, acetic and malic acids, etc. The Oil, a Spirit, and a Compound Spirit are official.

Preparations.

Oleum Juniperi, *Oil of Juniper*,—is the volatile oil, a colorless or faintly greenish-yellow liquid, sp. gr. 0.850 to 0.890; of terebinthinate and sweetish taste and the odor of juniper; soluble in 4 times its vol. of alcohol, and in an equal vol. of carbon disulphide. Dose, ♏v–xv.

Spiritus Juniperi, *Spirit of Juniper*,—has of the Oil 5 in Alcohol 95. Dose, ʒj-iv or more, according to the quantity of alcohol desired.

Spiritus Juniperi Compositus, *Compound Spirit of Juniper*,—has of the Oil 8, Oil of Caraway 1, Oil of Fennel 1, Alcohol 1400, Water to 2000. It approximates closely a good grade of *Gin*. (See *ante*, page 131.) Dose, ʒj-iv, or more, according to the quantity of alcohol desired.

Oleum Cadinum, *Oil of Cade, Empyreumatic Oil of Juniper*,—is a product of the dry distillation of the wood of *Juniperus Oxycedrus*. It is a tar-like substance, of uncertain composition and purity: a dark-brown, clear, thick liquid, of tarry odor and a somewhat bitter, burning taste; insoluble in water, partially soluble in alcohol, completely so in ether, chloroform or carbon disulphide. Used locally as a stimulant in psoriasis and chronic eczema.

Infusum Juniperi, *Infusion of Juniper* (Unofficial),—has of Juniper Berries ℥j in Oj of boiling water. Dose, ℥j-ij.

Juniper is a stomachic tonic, diaphoretic, diuretic and aphrodisiac. The oil is the active principle, and is readily diffused, exciting increased cardiac action, stimulating the renal functions and the action of the skin, and causing a subjective sense of heat throughout the system. It is eliminated chiefly by the kidneys, and may set up renal irritation, in large doses producing strangury, priapism, hematuria, suppression of the urine and uremic convulsions. It imparts a violet odor to the urine, and will produce diuresis when inhaled.

The Oil of Juniper is used to flavor gin and to impart the diuretic power popularly ascribed to that liquor. The medicinal use of the juniper preparations (spirit and compound spirit) is restricted to their employment as vehicles for less irritant diuretics. The oil acts therapeutically like the oil of Turpentine, and may be used in chronic pyelitis and cystitis, prostatorrhea, gleet, etc., but is contraindicated in all cases where acute inflammation of the kidneys exists.

Oil of Cade is used locally in chronic skin diseases as a stimulant application. It is too active for acute eruptions, but has been used with benefit in chronic eczema and psoriasis. The Oil of Tar (see under PIX) is equally efficient for all the purposes to which the Oil of Cade has been applied.

KAMALA, Rottlera,—the glands and hairs from the capsules of *Mallotus philippinensis*, or *Rottlera tinctoria*, a small tree of the nat. ord. Euphorbiaceæ, growing in Abyssinia, Arabia, India, China, etc. It occurs as a granular, mobile, brick-red powder, inodorous and nearly tasteless, partly soluble in alcohol and in ether. It contains several resins, one of which is named *Rottlerin*, $C_{11}H_{10}O_3$, also tannin, starch, gum, red coloring matter, etc. There are no official preparations. Dose, ʒss-iij.

Kamala is anthelmintic and purgative, sometimes causing nausea and colic, seldom vomiting. It is used as a teniafuge and to expel the round and thread worms. One or two drachms are given suspended in water, mucilage or syrup, and repeated in 4 hours if necessary. A tincture (℥vj in ℥xvj of alcohol) may be used in doses of ʒj-℥ss. In India it is used locally in scabies and other skin affections and has been found of especial service in herpetic ringworm. As a remedy against tapeworm it is perhaps next after Male-fern in efficiency and requires no preparatory treatment.

KAVA-KAVA, Ava-Kava (Unofficial),—the root of *Piper methysticum*, a shrub of the nat. ord. Piperaceæ, growing in South America and the South Sea Islands. It contains a crystalline principle, *Kavahin* or *Methysticin*, which is analogous to Piperin, an acrid, greenish-yellow resin, *Kawin*, which is probably the active principle, also a Volatile Oil. Dose, ʒss–j, macerated in water, or the same quantity of a fluid extract.

Kava is intoxicant, diuretic and motor-depressant. A beverage is prepared in the Hawaiian Islands by chewing the root and then infusing it in water or cocoanut milk, which produces a drowsy intoxication with pleasant dreams often of erotic character, and followed by severe headache. A moderate dose is tonic and stimulant, lessening the sense of fatigue and sharpening the mental faculties. It is highly recommended in gonorrhea and gout, also in chronic gleet and obstinate cystitis.

KINO,—is the inspissated juice of *Pterocarpus Marsupium*, a tall tree of the nat. ord. Leguminosæ, growing in India. It contains 75 per cent. of a variety of tannin named *Kino-tannic Acid*, which gives a greenish precipitate with persalts of iron, also a crystalline, neutral substance, *Kinoin*, and *Kino-red*, gum, pectin, etc. There are several other varieties of Kino in the market, brought from S. America, Africa, Australia, etc., which are products of other trees than the official one.

Tinctura Kino, *Tincture of Kino*,—has of Kino 10, in Alcohol 65, Water 20 and Glycerin 15. Dose, ʒss–ij.

Pulvis Kino Compositus, *Compound Powder of Kino* (Unofficial),—contains 5 per cent. of Opium, and has of Kino 15, Opium 1, Cinnamon 4. Dose, gr. v–xx.

The action of Kino is the same as that of Tannic Acid, though less powerful, and it may be used for the same purposes, both internally and locally. It is chiefly employed as an astringent gargle and as a constituent of diarrhea-mixtures. The tincture, in drachm doses, is one of the most efficient means of combating the atonic diarrhea which results from the disuse of opium or morphine.

KRAMERIA, Rhatany,—is the root of *Krameria triandra* and *Krameria Ixina*, shrubs of the nat. ord. Polygaleæ, growing in S. America, the first-named in Peru and the latter in New Granada. It contains 20 to 45 per cent. of *Rhatania-tannic Acid*, also *Rhatanine*, an alkaloid, and wax, gum, etc.

Extractum Krameriæ, *Extract of Krameria*,—aqueous. Dose, gr. v–x.

Extractum Krameriæ Fluidum, *Fluid Extract of Krameria*.—Dose, ♏v–ʒss.

Tinctura Krameriæ, *Tincture of Krameria*,—20 per cent. Dose, ♏v–ʒj.

Syrupus Krameriæ, *Syrup of Krameria*,—has of the Fluid Extract 45 parts, with Syrup 55. Dose, ʒss–℥ss.

Trochisci Krameriæ, *Troches of Krameria*,—each troche contains gr. j of the extract, with Tragacanth, Sugar and Orange-Flower Water.

Krameria possesses the same astringent qualities as Tannic Acid and may be employed for the same purposes, except as an antidote to Antimony. It has long had a high reputation as an injection for fissure of the anus, as a local application to spongy gums, as a tonic for debilitated subjects, in chronic diarrhea, also in passive hemorrhages and mucous discharges, as menorrhagia and leucorrhea.

LACTUCARIUM, Lettuce,—is the concrete milk-juice of *Lactuca virosa*, the Acrid Lettuce, a biennial European plant of the nat. ord. Compositæ. It is partly soluble in alcohol and in ether, and yields a turbid mixture when triturated with water. Lactucarium is a mixture of several substances, the most important being *Lactocin*, which is thought to be the active principle. It occurs in white scales, soluble in water, and used as a sedative and hypnotic in doses of gr. j–v. Lactucarium also contains three bitter principles, *Lactucin*, *Lactopicrin* and *Lactucic Acid;* also *Lactucerin*, an inert, waxy substance, constituting nearly one-half of the drug. A minute quantity of a mydriatic alkaloid, believed to be *Hyoscyamine*, has been found in the plant, but not in commercial lactucarium.

Tinctura Lactucarii, *Tincture of Lactucarium*,—50 per cent. Dose, ♏x–ʒij, according to the activity of the drug.

Syrupus Lactucarii, *Syrup of Lactucarium*,—has of the Tincture 10 per cent. Dose, ʒj–℥j.

Lactucarium is feebly hypnotic, somewhat sedative and diuretic. It is supposed to act similarly to Opium, but very feebly and without depressing after-symptoms. As much as half an ounce has been given to a dog without causing any special effect. Its preparations are very uncertain in activity, and are chiefly used as placebos, to allay cough and quiet nervous irritability. The syrup is a good vehicle for expectorants and antispasmodics.

LAPPA, Burdock,—is the root of *Arctium Lappa*, and of other species of *Arctium*, the common Burdock, a biennial weed of the nat. ord. Compositæ, found in waste places and along roadsides in Europe, Asia and N. America. Three varieties are recognized, formerly known as *Lappa major*, *L. Tomentosa*, and *L. Minor*, of which the first-named is most frequently met with in this country. It contains a bitter principle, traces of a volatile oil, also inulin, resin, tannin, mucilage, sugar, etc.

Extractum Lappæ Fluidum, *Fluid Extract of Lappa*,—made with diluted alcohol. Dose, ʒj–ij. Dr. Squibb recommended a Tincture of the seed; lb. j of ground seed to gall. j of whiskey, allowed to stand for two weeks before decanting, and used in doses of ʒij–iij before meals.

Lappa promotes all the secretions and is considered aperient, diuretic and diaphoretic, without irritating qualities. In decoction it has been a popular domestic remedy for many morbid conditions, especially rheumatism, gout, pulmonary catarrhs, and chronic cutaneous affections. By several practitioners it is praised as an alterative in constitutional diseases, as syphilis and scrofula, also as an external application to swellings, hemorrhoids and chronic sores. A tincture of the seed has proved remarkably efficient as a stomachic tonic and has cured several cases of psoriasis inveterata. [See Squibb's *Ephemeris*, vol. i, p. 116.]

LAVANDULA, Lavender,—the source of the official Oil of Lavender Flowers, is the fresh flowers of *Lavandula officinalis*, a small European shrub of the nat. ord. Labiatæ, largely cultivated in England. They have a fragrant odor, and an aromatic, camphoraceous taste; and contain resin and tannin, also a *Volatile Oil*.

Oleum Lavandulæ Florum, *Oil of Lavender Flowers*,—is a volatile oil distilled from fresh Lavender, and having the fragrant odor of the flowers. It is soluble in alcohol in all proportions, also in 3 times its volume of a mixture of alcohol 3 and water 1, also in glacial acetic acid. Dose, ♏j–v.

Spiritus Lavandulæ, *Spirit of Lavender*,—has of the Oil 5, in Deodorized Alcohol 95. A perfume and flavoring agent. Dose, ʒss–j.

Tinctura Lavandulæ Composita, *Compound Tincture of Lavender*,—an aromatic stimulant, composed of the Oil 8, Oil of Rosemary 2, Cassia Cinnamon 20, Cloves 5, Nutmeg 10, Red Saunders 10, Alcohol 700, Water 250, Diluted Alcohol to 1000. Is a constituent of Liquor Potassii Arsenitis. Dose, ʒss–ij.

Lavender is aromatic, stimulant and carminative, but is rarely used alone as a medicine. It is an agreeable flavoring and perfume, in the form of the official spirit, which is sold under the name of "*Lavender-water*," after the addition of Oil of Bergamot and Essence of Ambergris. The compound tincture, formerly called the compound spirit of Lavender, is a very agreeable combination of spices, and is much used as a remedy for gastralgia, nausea, flatulence, etc., and as an adjuvant or corrigent of other medicines.

LEPTANDRA, Culver's Root,—is the rhizome and rootlets of *Veronica virginica*, an indigenous perennial plant of the nat. ord. Scrofularineæ. It contains a glucoside named *Leptandrin*, which is probably the active principle, also Saponin, resin, tannin, etc. The Leptandrin of the shops is an impure alcoholic extract.

Extractum Leptandræ, *Extract of Leptandra*,—is a constituent of Pil. Catharticæ Vegetabiles. Dose, gr. j–iij.

Extractum Leptandræ Fluidum, *Fluid Extract of Leptandra*.—Dose, ♏xx–ʒj.

Leptandra is tonic, laxative, and like other resin-bearing purgatives is decidedly cholagogue. The recent root is a violent cathartic, but in the dried state it is less active. It is indicated in duodenal indigestion and chronic constipation with insufficiency of the biliary and intestinal secretions.

LICOPERDON GIGANTEUM, **Puff-Ball** (Unofficial),—is a common fungus of the nat. ord. Trichogastres, found in hilly and wooded districts. The dust, which consists of the capillitium and spores, is a valuable hemostatic, and dusted over bleeding surfaces acts promptly in arresting hemorrhage. It has been proposed as a surgical dressing, but while useful in emergencies where other agents are unattainable, the fetor which results from its application to wounds will prevent its use becoming general for this purpose. It may prove of value as an internal hemostatic in hematemesis and the hemorrhage of typhoid fever.

LIMON, **Lemon**,—is the fruit of *Citrus Limonum*, a tree of the nat. ord. Rutaceæ, native in Asia, but cultivated in Southern Europe and many other countries. It is official in the two forms described below. The Orange (*Citrus Vulgaris* and *C. Aurantium*), the Citron (*Citrus medica*), and the Lime (*Citrus acris*), all belong to the same genus.

Limonis Cortex, *Lemon Peel*,—is the rind of the recent fruit, and contains a *Volatile Oil*, $C_{10}H_{16}$, which is official, and a bitter crystalline glucoside, *Hesperidin*, chiefly contained in the white of the rind.

Limonis Succus, *Lemon Juice*,—is the freshly expressed juice of the ripe fruit, each lemon yielding from ⅔ to 1 fluid ounce. It contains about 7 per cent. of free Citric Acid, besides Phosphoric and Malic Acids, Citrates of Potassium and of other bases, etc. Dose, ℥ss–iv.

Acidum Citricum, *Citric Acid*, $H_3C_6H_5O_7 + H_2O$,—is obtained from the juice of the Lemon or the Lime by adding chalk to form calcium citrate, which is then decomposed by dilute sulphuric acid. It occurs in colorless, rhombic crystals which are very soluble in water. A solution of gr. xvij in ℥ss of water corresponds to ℥ss of fresh lemon-juice, and this quantity of either will neutralize of Potassium Bicarbonate gr. xxv, of Sodium Bicarbonate gr. xx, and of Ammonium Carbonate gr. xivss. Dose, gr. x–xxx.

Citrates of Bismuth, Bismuth and Ammonium, Iron, Iron and Ammonium, Iron and Quinine, Iron and Strychnine, Lithium, Magnesium, Potassium, nine in all, are official. They are described under their respective bases, to which their medicinal qualities are due.

Preparations.

Oleum Limonis, *Oil of Lemon*, $C_{10}H_{16}$,—is the volatile oil, isomeric with oil of turpentine, and extracted from fresh lemon peel by mechanical means. It is used for flavoring and is an ingredient of Spiritus Limonis, Spiritus Aurantii Compositus, and Spiritus Ammoniæ Aromaticus. Dose, ♏j–v.

Spiritus Limonis, *Spirit of Lemon*, *Essence of Lemon*,—is prepared by macerating 5 of the Oil and 5 of the Peel, freshly grated, in Deodorized Alcohol to 100. Used for flavoring. Dose, according to the amount of alcohol desired to be given.

Syrupus Acidi Citrici, *Syrup of Citric Acid,*—has of Citric Acid 10, Water 10, Spirit of Lemon 10, Syrup to 100. Dose, indefinite.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Lemon-peel is bitter and probably tonic to the stomach, but is used only for flavoring purposes. Lemon-juice, on the other hand, is refrigerant and antiscorbutic, entering the blood as alkaline citrates, potassium salts and phosphoric acid, the citrates being therein partly oxidized into CO_2 and H_2O, while the potassium salts and phosphoric acid probably act upon the red corpuscles. Citric Acid has the same general action as Acetic and the other vegetable acids. It is wholly decomposed in the blood, and appears to be non-toxic in man, but used internally it may precipitate uric acid and thus promote the formation of calculi. Lemon-juice is employed largely in the treatment and prevention of scurvy, in which disease it possesses powers of specific rank, but whether its action therein is due to the citric acid, the phosphoric acid or the salts of potassium is not known. Lime-juice is equally efficient but Citric Acid itself is not so.

As refrigerants and diuretic mixtures in fevers, Lemon-juice and Citric Acid are much used, entering into the composition of lemonades, effervescing draughts, etc., to allay thirst and subdue restlessness, and to promote the action of the skin and the kidneys. For acidity of the stomach they are efficient if given in small doses before meals, but the mineral acids are usually preferred for this purpose. Long continued they will impair digestion and impoverish the blood. Atheromatous degeneration of the vessels is said to be retarded by the daily use of lemon-juice, which is supposed to dissolve the excess of inorganic matter and to aid its excretion. Obesity may be reduced by using the juice of limes or lemons in large quantity, but it will be done at the expense of the digestion. Lemon-juice has been found of service in acute rheumatism, probably through the alkalies which it conveys into the blood. As a local application it has been found efficient in pruritus scroti, sunburn, post-partum hemorrhage, and as a gargle in diphtheritic sore throat.

LINUM, Linseed, *Flaxseed,*—is the seed of *Linum usitatissimum* (flax), a cultivated annual plant of the nat. ord. Lineæ. It contains 15 per cent. of *Mucilage* in the epithelium, also 30 to 40 per cent. of *Fixed Oil* in the embryo. Ground Linseed should yield not less than 25 per cent. of the fixed oil.

Preparations.

Oleum Lini, *Linseed Oil,*—the fixed oil expressed from Linseed without the use of heat. A yellow, oily liquid, of slight odor, bland taste, and neutral reaction, soluble in about 10 of absolute alcohol and in 1½ of ether. Consists chiefly of the Glyceride of *Linoleic Acid,* $C_{16}H_{28}O_4$, which having a powerful affinity for oxygen becomes resinoid on exposure to the air, making it a "drying oil." Dose, ℥ss–ij.

Infusum Lini, *Linseed Tea* (Unofficial), Linseed ʒiij, Liquorice-root ʒj, Boiling Water ℥x, infused for four hours and strained. Dose, indefinite.

Linimentum Calcis, *Lime Liniment*, *Carron Oil*,—consists of equal volumes of Linseed Oil and Lime-water, emulsified by agitation. A favorite application for burns.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Linseed is demulcent, emollient, expectorant and diuretic. The oil is laxative in a dose of ℥j, and in smaller doses is oxidized in the system and excreted as a resinoid body by the kidneys, which it stimulates slightly. The Infusion contains the mucilaginous principle and a small portion of the oil, and is advantageously used in inflammations of the mucous membrane of the throat, the gastro-intestinal tract and the urinary passages. It is an excellent demulcent in coughs of various kinds, and will be found very serviceable in cystitis, irritable bladder, renal colic, strangury, etc. The Oil may be administered internally as a laxative, and has considerable reputation as a remedy for hemorrhoids in doses of ℥ij twice daily. For laxative purposes (especially in children) it is usually administered as an enema. Externally it is a favorite application to burns, when made into an emulsion with lime-water, as in the official Linimentum Calcis. The ground seed (linseed or flaxseed meal), is one of the best agents for making poultices, and is universally employed for that purpose. [Compare the article on POULTICES in Part III.]

LITHIUM, Li,—is represented in the Pharmacopœia by five of its salts, of which the Carbonate is but slightly soluble while the others are readily so. The low atomic weight of this metal (7) makes its saturating power greater than that of other alkaline metals, hence the value of its salts in medicine.

Salts of Lithium.

Lithii Benzoas, *Lithium Benzoate*, $LiC_7H_5O_2$,—is classed with the Benzoates and described under BENZOINUM.

Lithii Bromidum, *Lithium Bromide*, LiBr,—is classed with the Bromides and described under BROMUM.

Lithii Carbonas, *Lithium Carbonate*, Li_2CO_3,—a light, white powder, permanent in the air, odorless, of alkaline taste and reaction, soluble in 80 of water, insoluble in alcohol. Dose, gr. ij–xv.

Lithii Citras, *Lithium Citrate*, $Li_3C_6H_5O_7$,—a white, deliquescent powder, odorless, of faintly alkaline taste and neutral reaction, soluble in 2 of water, almost insoluble in alcohol. Dose, gr v–xxx.

Lithii Citras Effervescens, *Effervescent Lithium Citrate*,—prepared from the Carbonate 7, with Sodium Bicarbonate 28, Citric Acid 37, and Sugar to 100. Dose, ʒj–ij, in water, as an effervescent drink.

Lithii Salicylas, *Lithium Salicylate*, $2LiC_7H_5O_3$,—is classed with the Salicylates and described under SALIX.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

The Lithium salts have strong alkaline qualities and act on the system in the same manner as other alkalies (see under POTASSIUM). The high saturating power of this metal makes its salts more alkaline than those of potassium, sodium, or calcium, hence more efficient in alkalinizing the urine. Lithium Urate is the most soluble of the alkaline urates, hence the value of lithium salts in the uric acid diathesis. The Carbonate and Citrate are the salts referred to in this connection, the others partaking more of the qualities of their acid factors. Both these salts are antacid and strongly diuretic ; the carbonate being but slightly soluble should be given in carbonic acid water, and the citrate in dilute solution. The latter may be extemporaneously prepared by adding citric acid to an aqueous solution of the carbonate, and in the organism is decomposed, the citric acid being oxidized and the carbonate formed. Many mineral waters contain small quanties of the carbonate, varying from a mere trace to grain 0.01 in a pint, an amount so minute as to be practically inert in comparison with the much greater quantities of potassium and sodium salts in the same waters.

Lithium Carbonate and Citrate are extensively used in gout and the lithemic diathesis, for the purpose of holding the uric acid in solution as lithium urate and preventing its deposit in the tissues as sodium urate which is less soluble. Their prolonged administration is so efficient in this affection that they have been credited with the power of dissolving uric acid calculi and called lithontriptics. They are also highly useful in the indigestion and rheumatism of obese subjects, and in irritable bladder from excess of acid in the urine. Lithiated Arsenical Water has been highly praised as a remedy in diabetes.

LOBELIA, Lobelia, *Indian Tobacco,*—the leaves and tops of *Lobelia inflata,* nat. ord. Lobeliaceæ, collected after a portion of the capsules have become inflated. The plant is a common annual weed growing on roadsides throughout the United States, having pale-green alternate leaves, and small, pale-blue flowers. It contains gum, resin, fixed oil, wax, lignin, salts of calcium, potassium and iron, a liquid alkaloid, *Lobeline,* which is the narcotic principle of the plant, also *Lobelic Acid,* and an acrid substance named *Lobelacrin.*

Preparations.

Extractum Lobeliæ Fluidum, *Fluid Extract of Lobelia.* Dose, ♏j-x.
Tinctura Lobeliæ, *Tincture of Lobelia,*—20 per cent. Dose, ♏v-xxx.
Infusum Lobeliæ, *Infusion of Lobelia* (Unofficial),—℥j to a pint. Dose, ʒj-℥j.
Lobelinum, *Lobelin* (Unofficial),—an impure resinoid. Dose, gr. ss-j.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Lobelia has an acrid, nauseous taste, and a heavy, unpleasant odor. It expectorant, diaphoretic, emetic, purgative, antispasmodic, motor-depressant and narcotic. It excites an abundant flow of saliva, much gastric mucus, profuse urination and sweating, with nausea, vomiting and great depression. The heart's action is enfeebled, and the blood-pressure, at first increased, soon falls; muscular debility, reduced temperature and coma follow, and death occurs by paralysis of the respiratory apparatus. The drug produces paralysis of the motor nerve-trunks, the peripheral vagi, and probably the respiratory and vaso-motor centres also. It strongly resembles tobacco in its action, and is highly dangerous in full medicinal doses, having caused many deaths when administered therapeutically, the most important instance of its fatal results being the case of Ezra Lovett, Jr., who in 1809 was poisoned by Lobelia administered by the founder of the Thomsonian sect of medical practitioners. The responsible party escaped conviction on the plea that he gave the drug in ignorance of its qualities.

Antidotes and Incompatibles.

Tannic Acid to form the insoluble tannate. *Strychnine*, Picrotoxine and Thebaine antagonize its action on the nervous system; the vaso-motor excitants, as *Alcohol*, Digitalis, Belladonna, Ergot, etc., antagonize its effects on the circulation. Caustic Alkalies are incompatible, decomposing the alkaloid.

Lobelia was a favorite remedy with the Indians at the time of the first settlement of the United States, and was introduced into regular practice as an anti-asthmatic, after having served as the main stock-in-trade of irregular practitioners for many years. Its principal therapeutic action is that of an antispasmodic, and in cautious hands it is extremely useful in paroxysmal spasmodic asthma, as also in dry cough with constant tickling in the throat. As an enema in cases of strangulated hernia the infusion is much safer than tobacco and fully as efficient, and may overcome the obstruction in intussusception, while the tincture in 2-drop doses every hour will often relieve a case of impacted cecum. In constipation from atony and deficient secretion a 10-minim dose of the tincture at bedtime acts excellently, and in the poison-oak eczema the infusion is a good local application. As an emetic it is entirely too depressant for children.

LYCOPODIUM,—is a very mobile, pale-yellow, fine powder, consisting of the spores of the Club-moss, *Lycopodium clavatum*, and of other species of Lycopodium (nat. ord. Lycopodiaceæ), a native of Europe and the U. S. Lycopodium is odorless, tasteless, floats on water, which does not wet it, and burns quickly when thrown on a flame. It should be free from pine-pollen, starch, sand and other impurities, which are detected by means of the microscope, the lycopodium spores being about $\frac{1}{800}$ of an inch in diameter, four-sided and reticulated, with short projections on the edges. They contain about 47 per cent. of a bland, fixed oil.

The plant was formerly considered to be diuretic and antispasmodic, and was used in rheumatism and epilepsy, also in pulmonary and renal disorders. The powder is employed quite extensively in pharmacy to facilitate the rolling of a pill-mass and to prevent adhesion of pills to each other. It makes an excellent absorbent and protective powder when dusted over an excoriated surface, as between the thighs of infants.

By the homeopathic practitioners Lycopodium is elevated to the rank of an active drug when triturated with sugar of milk sufficiently long to break up the seeds and liberate their oily contents. In their first centesimal trituration ($\frac{1}{100}$) it is said to have produced symptoms of excitement of the circulation and irritation of the urinary organs, and they profess to use it with benefit in affections of the mucous tracts, dyspepsia, pyrosis, flatulence, constipation, ileo-colitis of infants, hepatic congestion, aneurism, chronic affections of the lungs and bronchi, diphtheria, lithiasis, intertrigo, porrigo capitis, plica polonica and pruritus ani, in all of which as an internal remedy and in high attenuation.

MAGNESIUM, Mg.—This metal is represented by its Oxide, Carbonate, Citrate and Sulphate, of which the last occurs native in sea-water, caves, etc., the others being prepared from it. The first two are almost insoluble in water or alcohol. Its salts are either white or colorless, and those which are official are as follows:—

Official Salts of Magnesium.

Magnesia, *Magnesia, Magnesium Oxide*, MgO,—made by heating the light carbonate in a crucible to expel nearly all the carbonic acid. A white, light and very fine powder, almost insoluble in water, insoluble in alcohol, and gelatinizes with 15 of water after standing ½ hour, having become hydrated. Is a constituent of Pulvis Rhei Compositus, Massa Copaibæ and Ferri Oxidum Hydratum cum Magnesia. Dose, gr. x–ʒj.

Magnesia Ponderosa, *Heavy Magnesia, Magnesium Oxide*, MgO,—is a white, dense and very fine powder, corresponding in other properties and reactions to Magnesia, except that it does not gelatinize with water. It is made by calcining the heavier carbonate, and is much slower in action than the light magnesia. Dose, gr. x–ʒj.

Magnesii Carbonas, *Magnesium Carbonate* $(MgCO_3)_4Mg(HO)_2 + 5H_2O$,—light, friable masses, or powder, odorless and tasteless, insoluble in alcohol, almost insoluble in water. Dose, gr. x–ʒj.

Magnesii Sulphas, *Magnesium Sulphate, Epsom Salt*, $MgSO_4 + 7H_2O$,—colorless prisms or acicular needles, slowly efflorescent, odorless, of cooling, saline taste, and neutral reaction, very soluble in water, insoluble in alcohol. Is a constituent of Infusum Sennæ Compositum. Dose, ʒj–℥j.

Preparations.

Magnesii Citras Effervescens, *Effervescent Magnesium Citrate*,—is prepared from the Carbonate 10, Citric Acid 46, Sodium Bicarbonate 34, Sugar 8, Alcohol and Distilled Water, as required. A coarsely granular, white, deliquescent salt, of acid taste and reaction, soluble in 2 of water, insoluble in alcohol. Dose, ʒj–℥j.

Liquor Magnesii Citratis, *Solution of Magnesium Citrate*,—prepared from the Carbonate 15, Citric Acid 30, Syrup of Citric Acid 60, Potassium Bicarbonate 2½, Water to 360. Dose, ℥iv–vj, repeated for catharsis.

Mistura Magnesiæ et Asafœtidæ, *Magnesia and Asafetida Mixture, Dewees' Carminative* (Unofficial),—contains of the Carbonate 5, Tincture of Asafœtida 7, Tincture of Opium 1, Sugar 10, and Distilled Water to 100. Dose, ʒss–iv. Used for flatulent colic and diarrhea in infants.

PHYSIOLOGICAL ACTION.

Magnesia and the Carbonate are mildly laxative and antacid, neutralizing free acids in the stomach and forming therewith laxative salts. If used in large quantity for any length of time Magnesia may become hydrated and produce intestinal concretions. The freshly precipitated Hydrate (see above under *Magnesia*) is an antidote to arsenic in solution, but less effective than the hydrated sesquioxide of iron, with which it is combined in the official Ferri Oxidum Hydratum cum Magnesia. Magnesia may also be used in poisoning by acids or phosphorus.

The Citrate and Sulphate are saline cathartics, the latter being the more powerful on account of its bitterness. If administered in plenty of water it usually produces a prompt and free discharge from the intestines with but little irritation or griping, but often accompanied by a sense of coldness and depression. The purgative action is chiefly due to its causing a greatly increased secretion of intestinal fluids, not by outward osmosis from the vessels as was formerly taught, but by stimulation of the intestinal glandular appendages. If the purgative action should not take place a diuretic one may result, but to secure the desired catharsis the drug should be administered in a considerable quantity of water. Magnesium Sulphate is the principal aperient constituent of many of the popular laxative mineral waters, as Friedrichshall, Püllna, Hunyadi, etc. When injected into the circulation it is powerfully toxic, paralyzing first the respiration and then the heart. It abolishes sensation and paralyzes the sensori-motor reflex centres (Murrell).

THERAPEUTICS.

Magnesia and the Carbonate are used as antacids and laxatives, in acidity, sick headache, flatulent colic, etc., and as antidotes in poisoning by acids, arsenic, phosphorus, and mercuric and cupric salts. The Citrate is an agreeable laxative, cooling and acceptable to the stomach. The Sulphate is one of the most efficient of the saline cathartics and has a wide field of application. In acute inflammatory conditions, renal and cardiac dropsy, ascites from obstruction of the portal circulation, increased blood-pressure within the cranium, intestinal obstruction without acute inflammation, the constipation of lead poisoning, and habitual constipation from deficiency of the intestinal secretions, this agent will be found to be exceedingly serviceable. As it has but little influence on intestinal peristalsis it is usually combined with Senna, as in the official Black Draught, which increases its purgative action. Acute dysentery is well treated by magnesium sulphate combined with diluted sulphuric acid, and followed by opium and starch enemata. Bleeding from hemorrhoids and uterine hemorrhage are often relieved by the same combination when other agents fail. In acne vulgaris and other obstinate eruptions due to derangement of the stomach and intestinal canal, good results are often obtained by a purgative dose of the sulphate daily before breakfast, or by doses of 5 grains in water three or four times a day. The same salt, finely triturated, makes an excellent dusting powder for acne rosacea. The ferro-saline mixture (see *ante*, page 319) is a useful laxative in the constipation of anemic women. The bitter taste of this salt is best covered by coffee.

MAGNOLIA (Unofficial),—is the bark of *Magnolia glauca* (Sweet Bay, Swamp Sassafras), *M. acuminata* (Cucumber-tree), and *M. tripetala* (Umbrella-tree), all of which belong to the nat. ord. Magnoliaceæ, and are indigenous to the Eastern and Southern States. It contains a crystalline principle named *Magnolin*, which is insoluble in water, but soluble in alcohol, ether, etc. Dose of the powdered bark, ʒ ss–j.

Magnolia is an aromatic bitter tonic and diaphoretic, usually employed in chronic rheumatism, remittent and intermittent fever. In the latter affection it will arrest the paroxysms if used freely.

MANACA (Unofficial),—is the root of *Franciscea uniflora*, a shrub of the nat. ord. Scrophularineæ, indigenous to Brazil, where it is known as Mercurio-vegetal, or Vegetable Mercury, a name applied by charlatans to a number of widely differing plants. Very little is known about Manaca, but it has been extensively advertised as an unfailing remedy for sub-acute and chronic rheumatism. It is also considered purgative, diuretic, emmenagogue and antisyphilitic, being official in the Brazilian Dispensatories, and noticed as follows in the *Dict. de Botan. Brazileira*.

"This whole plant, but especially the root, excites powerfully the lymphatic system, eliminating morbid matter by the skin and kidneys. It is antisyphilitic; the interior bark is nauseating and stimulates the throat. In small doses it is resolvent; in larger purgative, diuretic and emmenagogue. In large doses it is an acrid poison."

A fluid extract is on the market, the average dose of which is ♏x.

MANGANUM, Manganese, Mn.—This metal is represented in the Pharmacopœia by three of its salts, the native Black Oxide, the Sulphate, and the Permanganate of Potassium.

Mangani Dioxidum, *Manganese Dioxide, Black Oxide of Manganese*,—is the native, crude Dioxide of Manganese, containing at least 66 per cent. of the pure Dioxide, MnO_2. A heavy, grayish-black powder, odorless and tasteless, insoluble in water or alcohol, giving off oxygen gas at a red heat, and if heated with hydrochloric acid it causes the evolution of chlorine gas. Is used in preparing Chlorine Water. Dose, gr. ij–x.

Mangani Sulphas, *Manganese Sulphate*, $MnSO_4 + 4H_2O$,—colorless prisms, of slightly bitter and astringent taste and faintly acid reaction, very soluble in water, insoluble in alcohol. Dose, gr. ij–v.

Potassii Permanganas, *Potassium Permanganate*, $KMnO_4$,—deep, purple-violet prisms, of sweet and astringent taste, neutral reaction, soluble in 16 of water with a scanty, brown residue, decomposed by alcohol and by heating to 464° F. It should be kept in well-stoppered bottles, and should not be triturated or combined in solution with organic or readily oxidizable substances. Dose, gr. ss–ij, in pill.

Unofficial Preparations.

Syrupus Mangani Iodidi, *Syrup of Manganese Iodide*,—contains about ʒj of the Iodide in each ℥. Dose, ♏x–xxx. For formula see U. S. Dispensatory.

Syrupus Ferri et Mangani Iodidi, *Syrup of Iron and Manganese Iodide*,—each ℥ contains gr. 50 of the mixed iodides in the proportion of 3 of the Iodide of Iron to 1 of that of Manganese. Dose, ♏x–xxx. For formula see U. S. Dispensatory.

Ferri et Mangani Carbonas Saccharatus, *Saccharated Iron and Manganese Carbonate*,—is a tasteless, reddish-brown powder. Dose, gr. v–xx. For formula see U. S. Dispensatory.

Pepto-mangan, *Liquor Mangano-ferri Peptonatus*,—a proprietary preparation, advertised to contain in each half-ounce "the equivalent of 3 grains of metallic Iron and 1 grain of metallic Manganese (as Peptonates) in organo-chemical combination." It is claimed for this preparation that it does not have the astringent effect of the inorganic salts of these metals upon the glands of the stomach, and that it does not affect the alkalinity of the bowels. Dose, ℥ ss, three to four times a day, in white wine or milk, or alone.

Condy's Red Fluid,—is a solution of Potassium Permanganate in Distilled Water, of about 1¾ per cent. strength, 8½ grains to the ounce, or 176 grains in 20 ounces. It is used as a disinfectant and deodorant for closets and bed-pans, also to wash the hands and utensils, but it cannot be employed to disinfect rooms. It is not irritant, and shows by its change of color when it has lost its efficacy. A one per cent. solution is official in the Br. Phar. the dose of which is given as ʒ ij–iv.

PHYSIOLOGICAL ACTION.

The salts of Manganese in small doses improve the appetite and the digestion and stimulate the action of the heart. Used in larger doses and for a considerable length of time they lower the heart's action, paralyze the muscular system especially the muscular coat of the arteries, and cause progressive wasting, paraplegia, and acute fatty degeneration of the liver. They are gastro-intestinal irritants, and the Sulphate is emeto-cathartic and decidedly cholagogue. Manganese is closely associated with Iron in the blood, bile, etc., in the proportion of about 1 to 20. The Black Oxide is an efficient emmenagogue.

Potassium Permanganate is an active oxidizer, containing as it does a large proportion of oxygen which it yields very readily in the form of ozone, and then becomes manganese dioxide. This property gives it the qualities of an antiseptic, a disinfectant and a deodorant. It is considered by some authorities to be an efficient emmenagogue. Used internally it is probably not absorbed in its own state, as it must be quickly decomposed by the contents of the stomach; at the same time it oxidizes any oxidizable substance therein.

THERAPEUTICS.

The salts of Manganese are used by those practitioners who affect to see a manganese-anemia in cachectic subjects, but they are always combined with preparations of iron. In amenorrhea, gastrodynia and pyrosis the dioxide is a good remedy, and the same salt is used as an ointment in many skin diseases. In jaundice of malarial origin or catarrh of the biliary passages the sulphate gives good results. Manganese is becoming more of an acknowledged remedy in derangements of the menstrual function, as irregular or scanty menstruation, amenorrhea, menorrhagia, and even metrorrhagia. By some authorities the emmenagogue power of potassium permanganate is ascribed to its large proportion of oxygen, which it is supposed to give up to the uterus; as potassium chlorate was formerly supposed to do to the system at large. According to the views of others who have studied its action, Manganese should be classed with the excito-motors, increasing arterial tension, and specifically acting upon the uterus. The best preparation is the Dioxide, in freshly made pills of two grains each, of which 1 to 3 or 5 pills may be taken twice or thrice daily. Potassium Permanganate has generally been the preparation given when the effects of Manganese were desired; but as it causes great gastric irritability, with abdominal pains and burning sensations, besides other decidedly unpleasant symptoms, it is a difficult matter to get patients to take it for any length of time.

Potassium Permanganate is employed as an antiseptic and oxidizing agent in such affections as diphtheria, scarlatina, septicemia, erysipelas, etc., in which it may be given internally and used locally at the same time. It is given with apparent benefit in dyspepsia, flatulence, lithemia and obesity, and has often seemed to be of service in acute rheumatism. In amenorrhea it is reported to be very efficient, and has been used with success as a remedy for the bites of venomous serpents and for other animal poisons. For internal use it should be given in pill, as the taste of a solution is very disagreeable. Locally it is frequently employed (ʒj to the pint) to correct fetor in cancer, ulcer, caries, abscesses, ozena, etc., and it will destroy the odor of a foul breath or that of the fetid perspiration of the feet. It is used both as a test and as a corrigent for organic impurities in drinking water. The stain left by it on fabrics may be removed by sulphurous acid, but as sulphuric acid is formed in the reaction the fabric should be immediately washed or rinsed in water.

Potassium Permanganate has lately come into use as an antidote against morphine or opium in the stomach, for which purpose it was recommended in 1884 by an English physician, Mr. J. Barker Smith. Little attention was paid to his suggestion until it was practically tested by Dr. William Moor, of New York, on himself, in 1895. After a light supper he swallowed 3 grains of morphine sulphate, followed almost immediately by 4 grains of potassium permanganate in water, and experienced no ill effects, although being highly susceptible to the drug he would have been affected if even gr. 1/8 of morphine had been absorbed. On another occasion, two hours after breakfast, he took 5 grains of morphine sulphate in water, and also 8 grains of the permanganate in 8 ounces of water soon afterwards, without experiencing any symptoms of morphine action. It has long been known that morphine is deoxidized and rendered innocuous by this agent, but it was supposed that the presence of albumin in the stomach would prevent their reaction. It is now shown that the permanganate reduces morphine sulphate more rapidly than it does albuminous matter, and in fact exhibits a marked selective affinity for morphine and also for physostigmine (eserine), but gives up its oxygen more quickly to albuminous substances than to strychnine, oxalic acid, colchicum or hydrocyanic acid. It exerts no oxidizing effect, in the presence of albumin, on atropine, hyoscyamine, hyoscine, caffeine, cocaine, aconitine, veratrine, pilocarpine, muscarine or phosphorus. (Murrell.)

O (Unofficial),—is the bark of *Mangifera indica*, an Indian tree of the nat. re. It is supposed to be an astringent with special tonic action upon mucous . It is highly recommended by its vendors for nasal catarrh, hemorrhages and muco-purulent discharges from the intestines, uterus, vagina and bronchi. A fluid extract is sold, which may be used in doses of ♏x–ʒj.

Mango-Fruit, or *Mangosteen*, is the fruit of *Garcinia mangostana*, nat. ord. Guttiferæ, also from India. It is a powerful astringent, and is used for nasal catarrh, diarrheas, dysentery, leucorrhea, etc.

MANNA,—is the concrete, saccharine exudation of *Fraxinus Ornus*, or Flowering Ash, a tree of the nat. ord. Oleaceæ, growing in Southern Europe. Manna is produced also by several other trees, and substances resembling it are exuded by many plants. It contains from 40 to 90 per cent. of *Mannit*, $C_6H_{14}O_6$, or Manna-sugar, which does not undergo vinous fermentation, and is chemically allied to the alcohols and to glycerin. It also contains glucose, mucilage, some acrid resin, and a small quantity of the fluorescent glucoside *Fraxin*, $C_{16}H_{18}O_{10}$. There are no official preparations, but Manna itself may be given in doses of ℥j–ij.

Manna is a mild laxative, with some tendency to produce flatulence and colic. It is usually combined with other purgatives, as Senna, Rhubarb, Magnesia, etc., to disguise the taste and increase the effect. It is a constituent of the official Infusum Sennæ Compositum. Manna may be eaten by children if of good quality, or may be readily dissolved in milk and so administered.

MARRUBIUM, Horehound,—the leaves and tops of *Marrubium vulgare*, a plant of the nat. ord. Labiatæ, native in Europe, but naturalized in America. It contains a bitter principle named *Marrubiin*, also a volatile oil, resin, tannin, lignin, etc. There are no official preparations. Dose, ʒss–j.

Horehound in large doses is laxative, diuretic and diaphoretic, and in ordinary dosage it is a gentle tonic and stomachic. It is generally used in catarrhal states of the air-passages, over which it seems to have a soothing effect, and is much employed in confectionery as an ingredient of "cough drops."

MASTICHE, Mastic,—is a concrete, resinous exudation from *Pistacia Lentiscus*, a tree of the nat. ord. Anacardiaceæ, growing in the island of Scio. Alcohol dissolves about 90 per cent. including the resin *Mastichic Acid*, the remainder consisting of another resin, *Mastichin*, which is soluble in ether and resembles copal. There are no official preparations, but Mastic is an ingredient of the official Pil. Aloës et Mastiches.

Mastic was formerly used for supposed properties analogous to those of other oleoresins, but now its application is confined to dentistry, being employed as a temporary filling for carious teeth. A solution of ether is applied on cotton with moderate pressure, and remains as a firm plug after evaporation of the solvent.

MATICO, the leaves of *Piper angustifolium*, a Peruvian shrub of the nat. ord. Piperaceæ. It contains a crystallizable acid *Artanthic Acid*, also resin, tannin, and a volatile oil. Its odor is aromatic, and its taste astringent, spicy and somewhat bitter.

Extractum Matico Fluidum, *Fluid Extract of Matico*. Dose, ʒss–ij.

Tinctura Matico, *Tincture of Matico*,—10 per cent. Dose, ℥ss–ij.

Matico is an aromatic tonic and stimulant, also aphrodisiac, vulnerary and hemostatic. It acts like cubebs on the urinary passages, and is an excellent alterative stimulant to mucous membranes. It has been used with considerable success in mucous catarrhs, as gonorrhea, leucorrhea, chronic cystitis, etc., also in epistaxis, hemorrhoids, menorrhagia, hemoptysis, hematemesis and other hemorrhages. The under surface of the leaf is so formed as to promote coagulation of blood if applied to a bleeding surface, and it is a good local hemostatic for trivial cuts or wounds.

MATRICARIA, German Chamomile,—the flower-heads of *Matricaria Chamomilla*, a European annual plant of the nat. ord. Compositæ. They contain ¼ per cent. of a blue Volatile Oil (the color of which is due to *Azulen*), also a bitter extractive, tannin, etc. There are no official preparations, but the flowers may be eaten or a decoction used almost *ad libitum*.

Matricaria is a mild tonic, in large doses emetic, anthelmintic and antispasmodic. It is much used in Germany, and in this country is a popular domestic remedy among German people, who use it in infusions as a diaphoretic. This plant is the *Chamomilla* of the homeopaths, who find in it remarkable power over morbid impressionability of the sensory and excito-motor nerves, and administer it in pains aggravated at night and by heat, clonic spasms of pregnancy, irritability of teething children, flatulent colic, etc.

MEL, Honey,—is a saccharine secretion deposited in the honeycomb by *Apis mellifica*, the honey-bee; occurring as a pale-yellowish, syrupy liquid, gradually becoming crystalline and opaque, of peculiar and heavy odor, and a very sweet, faintly acrid taste. It is a strong aqueous solution of several sugars (cane and grape sugar, levulose), with wax-pollen, coloring and odorous matters, etc. The sugars, which may be resolved into Levulose and Dextrose, amount to 70 or 80 per cent. Honey is frequently adulterated with starch and artificial glucose, which may be detected by the official tests (see U. S. Phar.). Dose, indefinite.

Preparations.

Mel Despumatum, *Clarified Honey*,—is honey heated, skimmed and strained, with Glycerin added in the proportion of 5 per cent. It is an ingredient of Confectio Rosæ, Mel Rosæ, and Massa Ferri Carbonatis. Dose, indefinite.

Mel Rosæ, *Honey of Rose*,—Fluid Extract of Rose 12, Clarified Honey to 100. Dose, indefinite; generally used as a local application to the throat for its astringency and flavor, in combination with more active agents.

Honey is emollient, nutritive and laxative, in some persons giving rise to pyrosis, flatulence and colic, and in others to an eruption of urticaria, but generally constituting an agreeable article of diet. It is sometimes actually poisonous from the presence of toxic agents extracted by the bee from certain plants, in this country generally the Mountain Laurel (*Kalmia latifolia*). Honey is chiefly used as an emollient in diseases of the throat, to relieve dryness, pain, cough and dysphagia. A mixture of Honey 8 parts to 1 each of Acetic Acid and Water is official in the Br. Phar. under the title OXYMEL, and forms a pleasant addition to gargles or a vehicle for expectorant medicines. Honey of Rose is somewhat astringent, and is used in gargles or in washes, for the treatment of inflammation and ulceration of the mucous membrane of the nasal passages, the mouth and the throat.

MELISSA, Balm,—the leaves and tops of *Melissa officinalis*, a European plant of the nat. ord. Labiatæ, growing also in America. It contains gum, tannin, bitter extractive, and a fragrant essential oil in very small quantity (⅛ to ¼ per cent.). There are no official preparations. Balm has little or no action, except to flavor hot water for use as a beverage or a mild diaphoretic.

MENISPERMUM,—is the rhizome and rootlets of *Menispermum canadense*, the Yellow Parilla, or Canadian Moonseed, a woody, climbing plant of the nat. ord. Menispermaceæ, native of the eastern U. S. It contains starch, *Berberine*, and a white alkaloid, which is soluble in alcohol and in ether.

Extractum Menispermi Fluidum, *Fluid Extract of Menispermum,*—is ⅔rds alcohol. Dose, ♏v–xx.

Menispermum is reputed to have tonic properties, and is used in some of the Southern States in domestic practice as a substitute for Sarsaparilla in scrofulous conditions. Little is known about it of a definite character.

MENTHA PIPERITA, Peppermint,—the leaves and tops of *Mentha piperita*, a perennial herbaceous plant, of the nat. ord. Labiatæ, a native of Britain, but largely cultivated elsewhere. They contain 1 to 1¼ per cent. of a Volatile Oil, which is official, and a little tannin.

Menthol, $C_{10}H_{19}OH$,—is a stearopten (having the character of a secondary alcohol), obtained from the official oil of peppermint, or from Japanese or Chinese oil of peppermint (from *Mentha arvensis* and *Mentha canadensis*); by deposit therefrom on exposure to cold. It occurs in colorless, acicular crystals, of the odor of peppermint, and a warm, aromatic taste, followed by a sensation of cold when air is drawn into the mouth. Soluble only slightly in water, freely in alcohol, ether, chloroform, carbon disulphide or glacial acetic acid. Dose, gr. ss–iij, in pill or spirituous solution, several times a day.

Preparations.

Oleum Menthæ Piperitæ, *Oil of Peppermint,*—is the volatile oil distilled from the fresh herb; a colorless or pale yellow fluid, having the odor of peppermint, and a strongly aromatic taste followed by a cold sensation when air is drawn into the mouth. It consists of a liquid terpene and the stearopten Menthol (see above). Dose, ♏j–v.

Aqua Menthæ Piperitæ, *Peppermint Water,*—has of the oil 2 parts in 1000 of Distilled Water. Dose, indefinite.

Spiritus Menthæ Piperitæ, *Spirit of Peppermint, Essence of Peppermint,*—is an alcoholic solution containing 10 per cent. of the oil and 1 per cent. of the powdered herb. Is an ingredient of Mistura Rhei et Sodæ. Dose, ♏x–xxx.

Trochisci Menthæ Piperitæ, *Peppermint Troches,*—each troche contains 1 per cent. of the Oil, with Sugar and Mucilage of Tragacanth. Dose, indefinite.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Peppermint is an aromatic stimulant, also carminative and antispasmodic. The oil possesses these qualities in greater degree and is also a local anodyne and anesthetic when applied locally, especially if its evaporation be prevented. The Chinese oil contains a large quantity of Menthol and is particularly anodyne. Menthol is antiseptic and locally anesthetic, but not corrosive, and acts also as a vascular stimulant when applied to the surface.

Peppermint is used internally for the relief of nausea and colic, and to expel flatus by its local stimulant and after sedative action on the bowels. It is an agreeable corrigent for combination with purgatives to prevent griping, and efficiently covers the taste of many nauseous substances. The spirit is the best form for internal use. The oil is used locally to relieve the pain of superficial neuralgia, a cloth being wet with it, laid along the course of the affected nerve and covered with oiled silk to restrain evaporation. It is also efficient in rheumatism as an anodyne and counterirritant.

Menthol is highly praised as an external application in various neuralgiæ, sciatica, pleurodynia, toothache, etc. For neuralgia it is used in saturated alcoholic solution painted over the affected nerve. For toothache a crystal introduced into the carious cavity is promptly anodyne. As an antiseptic it promises well as an application in parasitic skin diseases. As the Chinese have used their oil of peppermint for ages as an application in neuralgiæ, and as this oil contains a large quantity of Menthol, the latter preparation will probably prove a very efficient agent in these affections if the cupidity of the manufacturers will allow of its being obtained pure. A spray containing 5 to 20 per cent. of Menthol is highly recommended in epidemic influenza, also in tubercular laryngitis. Menthol is of marked value in almost all cases of pruritus, from whatever cause. It possesses high power as an anti-emetic, having stopped nausea and vomiting after the usual remedies had failed. For this purpose ten drops of a 20 per cent. solution in olive oil are given on sugar.

MENTHA VIRIDIS, Spearmint,—the leaves and tops of *Mentha viridis*, the "mint" of the kitchen garden, a plant of the nat. ord. Labiatæ, indigenous to England, but naturalized in many countries. Its constituents and properties are identical with those of peppermint, but its odor and taste differ therefrom.

Oleum Menthæ Viridis, *Oil of Spearmint*,—is the Volatile Oil distilled from the plant. Dose, ♏ij–v.

Aqua Menthæ Viridis, *Spearmint Water*,—has 2 parts of the Oil in 1000 of Distilled Water. Dose, indefinite.

Spiritus Menthæ Viridis, *Spirit of Spearmint*, *Essence of Spearmint*, is an alcoholic solution containing 10 per cent. of the Oil and 1 per cent. of the powdered herb. Dose, ♏x–xl.

Spearmint corresponds in action to Peppermint, but is less powerful. It is employed to correct flatulence and to relieve colic, and makes an agreeable flavoring for mixtures.

METHYLENE BLUE, Tetramethyl-Thionine Chloride (Unofficial),—is an anilin derivative, which when pure is seen in small, dark blue, scaly crystals, having a copper bronze tinge, soluble in water. Dose, gr. j–iij, four or five times a day.

This substance imparts a blue color to nerve tissue and to the urine. From the facts that it manifests a strong affinity for nerve tissue, especially for the axis cylinders of sensory nerves, and that it is the best staining agent for the microbe found in the blood of malarial subjects, this agent has been expected to possess anodyne power over neuralgic and rheumatic affections and to act as an antiperiodic in malaria. It has been employed by several observers as an antipyretic and internal antiseptic for rheumatism of the joints and muscles, for malarial fever, diphtheria, acute nephritis and cancer, with varying results. Its best action in malarial affections has been obtained in children, and being tasteless it may be administered to them with greater ease than quinine, besides being free from the vomiting and headache which so often result from the latter drug. In diphtheria in simple non-diphtheritic ulceration of the throat, a ten per cent. solution is used ly with great benefit so far as yet reported. It has been employed successfully in ases of chronic cystitis, also in two cases of diabetes mellitus, and has given satis- n in several very obstinate cases of rheumatoid arthritis. In a number of cases of different forms of insanity it has been used by injection for conditions of excitement with very satisfactory results (Bodoni). In the earlier stages of gonorrhea its internal administration will shorten the course of the disease (Horwitz).

MEZEREUM, Mezereum, *Mezereon,*—is the bark of *Daphne Mezereum* and of other species of Daphne, plants of the nat. ord. Thymelœaceæ, growing in mountainous districts of Europe and Asia and cultivated as a garden shrub in Britain. It contains an inert, fixed oil, an inactive glucoside, *Daphnin*, and an acrid *Resin*, which is the anhydride of a resinous acid named *Mezereinic Acid.* Mezereum is an ingredient of the compound decoction and the compound fluid extract of Sarsaparilla. Dose, gr. j–x.

Extractum Mezerei Fluidum, *Fluid Extract of Mezereum,*—is too acrid for internal use. It is an ingredient of the Linimentum Sinapis Compositum.

Mezereum is a sialogogue, and an intensely acrid, irritant poison, producing violent vomiting, purging, nephritis and gastro-enteritis. In small doses it is laxative and diuretic, and has had considerable reputation as an alterative. Externally the recent bark is a powerful local irritant, speedily producing vesication.

Mezereum is rarely used internally by itself, but is employed in mixtures with Sarsaparilla, etc., as an alterative in syphilis, rheumatism and some skin diseases of chronic type, but with doubtful efficacy. It has been used with good effect in toothache and as a masticatory in paralysis of the tongue. Its principal use is as a local irritant to keep up the discharge from issues or blisters, and to stimulate indolent ulcers.

MORRHUÆ OLEUM, Cod-liver Oil, *Oleum Jecoris Aselli,*—is a fixed oil obtained from the fresh livers of *Gadus Morrhua* (Cod-fish) or other species of *Gadus.* It is a colorless or pale yellow, thin, oily liquid, of slightly fishy odor and taste, and faintly acid reaction, soluble in ether. It consists chiefly of *Olein* and *Margarin*, with a peculiar principle named *Gaduin*, also *Trimethylamine*, free fatty Acids (oleic, palmitic, stearic), traces of Iodine, Bromine, Sulphuric and Phosphoric Acids, the ordinary inorganic salts of animal tissue and products, and perhaps bile constituents. When saponified it does not yield glycerin, but *Oxide of Propyl.* Three kinds or varieties are found in the market, the pale, the light-brown and the dark. The pale is the official oil and the purest. Dose, ʒj–ij on a full stomach, increased as assimilated.

Unofficial Preparations.

Glyconin Emulsion of Cod-liver Oil,—Ol. Morrhuæ ℥iv, Glyceritum Vitelli ʒix, Aromatic Spirit of Ammonia ʒj, Sherry Wine ℥ij, Diluted Phosphoric Acid ʒiv, Essence of Bitter Almond (ʒj of the Volatile Oil in Oss Alcohol) ʒij. The Cod-liver Oil is to be added to the Glyconin very slowly with brisk stirring, and the other ingredients added in the order named.

Hydroleine, *Hydrated Oil,*—is said to contain, in each dose of ʒij, Cod-liver Oil ♏80, Distilled Water ♏35, Pancreatin gr. 5, Soda gr. ⅓, Salicylic Acid gr. ¼.

PHYSIOLOGICAL ACTION.

The action of Cod-liver Oil is that of any other fat, except that it is more easily assimilated than any member of the class. Fats in small quantity are necessary for the digestion of nitrogenous food and form the molecular basis of the chyle, being prepared for absorption by the pancreatic juice and the bile, especially the latter. Fat is an essential constituent of the products of tissue formation, whether physiological or pathological, and is the principal material concerned in the production of force. After oxidation it is excreted as carbonic acid and water. Locally applied fats reduce the body-temperature.

Cod-liver Oil is the most easily digestible of fats, penetrating animal membranes with comparative ease after being emulsified by the pancreatic and biliary secretions, hence entering the lacteal vessels readily and appearing to carry with it the oily and nitrogenous elements of the food. The result is facilitation of the digestive process, increase of the red blood-corpuscles and of the body-weight, and stimulation of healthy cell-formation throughout the tissues. The properties of this oil have been ascribed to its biliary constituent, to iodine, free oleic acid, etc., but no satisfactory explanation has been offered until recently for the difference between its action and that of other animal or vegetable oils.

Gautier and Mourgues of Paris have made an exhaustive series of analytical researches upon Cod-liver Oil, and find that it contains—(1) FIXED BASES, *Aselline* and *Morrhuine*, the latter constituting about $\frac{1}{3}$ of the total alkaloids, and being probably one of the most efficient principles in the oil. (2) VOLATILE BASES, *Butylamine*, $\frac{1}{6}$ of the total bases; *Amylamine*, $\frac{1}{3}$ of the whole; *Dihydrotoluidine*, $\frac{1}{10}$ of the total alkaloids; *Hexylamine*, a small amount. (3) ACIDS, *Morrhuic Acid* $1\frac{1}{2}$ per cent., also a mixture of *Formic* and *Butyric Acids*; and a small proportion of *Phosphoric Acid*, derived from the phosphates, phospho-glycerates and lecithins of the extracts. As to the properties of these constituents they state that *Butylamine*, *Hexylamine*, and particularly *Amylamine* increase the urinary secretions. *Dihydrotoluidine* is a convulsivant toxic base. *Aselline* in sufficient doses produces dyspnea, stupor, convulsive disturbances, and if continued death. *Morrhuine*, the most important of the extractive principles, is a powerful stimulant of the functions of nutrition and assimilation, promoting metabolic changes; it produces a rapid circulation of the extractive residues of cell life towards the excretory organs, where they are eliminated, provoking in their way indirectly a powerful movement of assimilation correlative of the losses consequent upon the inverse movement of de-assimilation. This is considered to be proved by the super-excitation of appetite in animals brought under its influence. The physiological experiments with these substances demonstrate that cod-liver oil is a reconstituent of the tissues through its richness in phosphates, phospho-glyceric acid, and organically combined phosphorus. Bromine and iodine, which are present in small quantities, also contribute to the reparative action, but chiefly to the active principles butylamine, amylamine, and especially morrhuine and morrhuic acid does the oil owe its true medicinal value.

THERAPEUTICS.

The value of Cod-liver Oil is wholly that of a nutrient, its action being most marked in wasting diseases. In high febrile states or catarrhal conditions of the gastro-intestinal tract its use is contraindicated, but in phthisis a slight degree of fever will not interfere with its beneficial employment. It is found to be of most value in the chronic forms of phthisis, in chronic bronchitis and emphysema, chronic rheumatic disorders, atheroma of the arteries, strumous skin diseases and diarrhea, syphilodermat [illegible] a and epilepsy. In many disorders referable to [illegible] the nervous centres it is of great value as a nerve [illegible] from acute diseases it is of marked benefit.

It should always be considered as a supplementary food, and if its use endangers the appetite for other food it should be abandoned.

The administration of this valuable agent is a serious matter, as many patients cannot overcome their repugnance to its taste and smell. Various emulsions are on the market, but they are objectionable because in no case do they conceal the taste, and the efficacy of the oil is seriously impaired by the processes used in their preparation. Moreover, the temptation is very great to employ an inferior grade of the oil or to adulterate it with other fish-oils in the manufacture of these preparations, and when the commercial spirit of gain is remembered one can never be sure of the quality of the oil so prepared. The oil itself is the best form for use, in small doses, say a teaspoonful thrice daily for an adult, after meals, in black coffee, beer or lemon-juice. The essential oil of eucalyptus in the proportion of 1 part to 100 of cod-liver oil will effectually extinguish the odor and taste to many persons. Alkaline stomachics given before meals, the oil after, and a teaspoonful of Liquor Pancreaticus given half an hour afterwards, would be a good routine in most cases, the latter agent preventing the fishy eructations which often give so much trouble. Extemporaneous emulsions may be prepared with glyconin (see *ante*, page 381), white of egg, mucilage of tragacanth, extract of malt, or any syrup, and flavored with lemon, cinnamon or bitter almond. The addition of ♏iv of Ether to each ℥ of the oil promotes its digestion by stimulating the pancreatic secretion, and enables a patient to take it with whom it had previously disagreed.

Inunction by Cod-liver Oil is a method of value in the wasting diseases of children. A tablespoonful may be rubbed into the skin of the abdomen twice a day, and covered with a flannel binder having oiled silk or mackintosh-cloth outside. It readily passes through the skin and is absorbed, producing valuable and lasting results.

MOSCHUS, Musk,—is the dried secretion from the preputial follicles of *Moschus moschiferus* (the Musk Deer), an animal inhabiting the mountainous region of Central Asia. It occurs in irregular, unctuous grains, of a reddish-brown color, peculiar and penetrating odor and bitterish taste, contained in oval sacs about 2 inches in diameter, membranous on one side, hairy on the other. About 10 per cent. is soluble in alcohol, 50 per cent. in water. Chinese Musk in the pods or sacs is the most valuable, but all varieties are adulterated, the price of the drug being high. The odor is destroyed by drying, but returns again on the addition of moisture. Trituration with Camphor or Hydrocyanic Acid destroys it. The odorous principle has not been isolated, but is probably a product of decomposition which is constantly being formed. The constituents of Musk are a bitter resinous substance, ammonia, fat, cholesterin, etc. Dose, gr. ij–x.

Tinctura Moschi, *Tincture of Musk,*—5 per cent. Dose, ♏xx–ʒjss.

Musk is a very diffusible stimulant, acting directly on the nervous and circulatory systems, but without much energy. It is also an antispasmodic, and is employed with benefit in general prostration of the system with nervous agitation or irregular muscular action. It has been used with advantage in laryngismus stridulus, insomnia, the collapse of typhoid and typhus fevers, spasmodic affections of the stomach, obstinate hiccough and convulsions of children due to intestinal spasms. The pure Musk is very difficult to obtain, and its high price makes it an extremely expensive medicine, so that it is seldom used except as a perfume.

MYRCIÆ OLEUM, Oil of Myrcia, *Oil of Bay,*—is a volatile oil distilled from the leaves of *Myrcia acris*, or Bayberry, a tree of the nat. ord. Myrtaceæ, native of the West Indian Islands. It is a yellowish-brown liquid, of aromatic odor, pungent taste, slightly acid reaction, and soluble as a slightly turbid solution in an equal weight of alcohol. It contains a hydrocarbon and *Eugenic Acid.* Used only as a perfume.

Spiritus Myrciæ, *Spirit of Myrcia, Bay Rum,*—contains Oil of Myrcia 16, Oil of Orange-peel 1, Oil of Pimenta 1, Alcohol 1220, Water to 2000.

The Oil of Bay is an agreeable perfume used to prepare bay-rum and in other cosmetic preparations. The spirit, known as "Bay-rum," is used principally as a refreshing perfume, and is thought to relieve headache, faintness, etc., by application to the forehead or to the nostrils.

MYRISTICA, Nutmeg,—is the seed of *Myristica fragrans* deprived of its testa. The Nutmeg-tree is cultivated extensively in the East and West India Islands, belongs to the nat. ord. Myristicaceæ, and is a native of the Banda Islands in the Malayan Archipelago. The nutmeg contains 4 to 9 per cent. of the official Volatile Oil, and 30 per cent. of a concrete oil, commonly called *Oil of Mace,* which is a compound of fluid glycerides of oleic and butyric acids, and the solid glyceride of *Myristic Acid,* some resin and volatile oil. Dose, gr. v–xx.

Macis, *Mace,*—is the arillode (fleshy covering) of the seed of *Myristica fragrans,* the Nutmeg-tree. It occurs in narrow bands about an inch long, branched and lobed, of brownish-orange color, fragrant odor, warm and aromatic taste. It yields a fixed oil by pressure and a volatile oil by distillation, the latter being probably identical with Oil of Nutmeg. Dose, gr. v–xx.

Preparations.

Oleum Myristicæ, *Oil of Nutmeg,*—is the volatile oil, and consists chiefly of a terpene and an oxygenated oil, *Myristicol.* It is colorless or pale-yellow, of hot, spicy taste and neutral reaction, and is soluble in alcohol. Dose, ♏j–v.

Spiritus Myristicæ, *Spirit (Essence) of Nutmeg,*—is a 5 per cent. solution of the oil in alcohol. Dose, ʒj–ij.

Nutmeg is an ingredient of Acetum Opii, Pulvis Aromaticus, Tinctura Lavandulæ C
Trochisci Cretæ, and Trochisci Sodii Bicarbonatis.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Nutmeg is an aromatic stomachic of agreeable flavor. In small do
it stimulates the production of gastric juice and thus promotes digest
and increases appetite. It also relieves intestinal spasm and flatule
In large doses it is powerfully narcotic, acting directly on the cereb
and producing stupor and delirium. It is used chiefly for flavoring
poses [illegible] rally in substance grated as required, but has
[illegible] ative, anodyne and astringent in diarrheas an
[illegible] ieve nausea and vomiting. Strangury is effi

treated by small doses of powdered nutmeg given several times a day; and the same remedy is often used in the south of Germany to relieve the uncomfortable feeling experienced after drinking an excessive quantity of new beer. The Volatile Oil is decidedly rubefacient when used externally, and has narcotic powers if used internally in sufficient quantity. It is occasionally employed as an external stimulant in paralysis and chronic rheumatism. Mace is stimulant, carminative and aromatic. It is used solely as a spice or condiment.

MYRRHA, Myrrh,—is a gum-resin obtained from *Commiphora Myrrha*, an Arabian tree of the nat. ord. Burseraceæ. It occurs in roundish tears, having a waxy fracture, a balsamic odor and a bitter taste. When triturated with water it forms a brownish-yellow emulsion; treated with alcohol it yields a brownish-yellow tincture which turns purple on the addition of nitric acid. It contains *Gum*, 60 per cent.; *Myrrhin*, a resin, 35 per cent.; also *Myrrhol*, $C_{10}H_{11}O$, an oxygenated ethereal oil, 2 per cent. Dose, gr. x–xxx.

Tinctura Myrrhæ, *Tincture of Myrrh*,—20 per cent. Dose, ♏x–xxx.

Myrrh is also contained in Mistura Ferri Co., Pil. Aloës et Myrrhæ, Pil. Rhei Co., and Tinctura Aloës et Myrrhæ.

Locally applied Myrrh is stimulant and disinfectant to mucous membranes and ulcerated surfaces. Administered in small doses internally it acts as a gastric stimulant, but in large doses it irritates the gastro-intestinal mucous membrane, causing vomiting and purging. It quickens the action of the heart, diminishes bronchial secretion, and is a uterine stimulant and an emmenagogue. Myrrh is used in combination with other drugs, as noted above, for anemia, amenorrhea and bronchial catarrh. It is believed to diminish excessive secretion from the mucous surfaces of the uterus, vagina, bladder and bronchi, also to have an especially beneficial influence on chronic pharyngitis. Locally used the tincture has a good tonic action on diseased mucous surfaces and is applied with benefit to spongy gums, relaxed throat, aphthous patches and unhealthy ulcers, and diluted with water it makes an excellent gargle for ulcerated sore throat. Myrrh has long been employed as an ingredient of dentifrices.

Binz observed that the internal administration of Myrrh produced a leucocytosis in which the white blood-cells were increased to four times their original number. This fact has been made the basis of treatment in severe cases of diphtheria by Stroll, who reports 80 cases so treated with only one death, and has collected nearly 300 cases in which the same treatment was employed with strikingly good results. His prescription has of the tincture 4, glycerin 8, and distilled water to 200 parts, of which ℥j under 2 years of age, ℥ij up to 15 years, and ℥iij–iv for adults, every half hour or hour until the symptoms moderate, then every two hours, continued for 48 hours after the membrane disappears.

MYRTI OLEUM, Oil of Myrtle, *Myrtol* (Unofficial),—is a volatile oil distilled from the leaves of *Myrtus communis*, the Myrtle, nat. ord. Myrtaceæ, and consists of a mixture of *Pinene*, another hydrocarbon, and *Cineol;* the latter being identical with eucalyptol, and probably the active medicinal ingredient. Dose, ♏j–iij, in capsules, several times a day.

Myrtol is a very active antiseptic and parasiticide. Applied to a raw surface it is sufficiently irritant to excite inflammation, but it does not so affect the unbroken skin. Internally, in small doses, it excites a sense of warmth in the mouth, increases the saliva, and acts as a tonic to the stomach. Full doses are sedative to the nervous system, but large ones act as an irritant. It is eliminated by the lungs and kidneys, acting as an expectorant and as an antiseptic and stimulant to the mucous membranes at the points of elimination. It imparts an odor like that of violets to the urine of the person taking it.

Administered in small doses, Myrtol aids digestion, and is an efficient disinfectant and alterative in bronchorrhea, fetid bronchitis and gangrene of the lung; and in cystitis and urethritis it acts similarly through the urine on the local mucous membrane. It may be expected to give good results in chronic and capillary bronchitis, whooping-cough and humid asthma. It has rendered good service in hematuria not due to acute congestion, and in passive hemorrhages generally. Locally it has proved curative in favus, herpes, pityriasis and parasitic skin diseases; also in otorrhea, ozena and other foul discharges from ulceration of the mucous membranes. It has been employed successfully against both the round and the thread worm.

Chekan (Unofficial),—the leaves and shoots of *Myrtus Chekan*, nat. ord. Myrtaceæ, a native of Chili. They contain a Volatile Oil resembling that of eucalyptus, also *Chekanine*, a volatile alkaloid, and tannin. Chekan is antiseptic, tonic, expectorant and diuretic; and is chiefly used in catarrh of the mucous membranes, especially those of the bronchi and the bladder. It has been employed with benefit in cases of phthisis, and in bronchitis with thick, purulent expectoration. The expressed juice diluted with water makes a good lotion for conjunctivitis, and a decoction of the bark is valued as an astringent in dysentery. A fluid extract is marketed, the dose of which is ʒj–iij.

NAPHTALINUM, Naphtalin, *Naphtalene*, $C_{10}H_8$,—is a hydrocarbon product formed during the manufacture of ordinary coal gas. Chemically, it is one of the benzene derivatives, being formed by the union of two benzene groups in an overlapping ring (see *ante*, page 273). When redistilled, it crystallizes in colorless, rhomboid plates, of slightly tarry but strong odor, and burning, aromatic taste; insoluble in water,
n 15 of alcohol, very soluble in boiling alcohol, ether, chloro-
n disulphide, and fixed or volatile oils. It is seen frequently
f moulded blocks, under such names as *Alabastrine* and

Camphylene, for preserving furs and flannels from moths, and for placing in urinals for disinfectant purposes.

The dose of Naphtalin is from gr. ij to gr. viij, up to gr. lxxx per diem for adults; for children gr. j to gr. iij, every three hours. Being quite insoluble in water it must be given in emulsion, or as a powder with sugar in wafers or capsules. It is best flavored with oil of bergamot.

Derivatives.

Naphtol, *Beta-* (*Iso-*) *naphtol*, $C_{10}H_7OH$,—a phenol occurring in coal-tar, but usually prepared from Naphtalin. It is one of several naphtols, and occurs in colorless, shining, crystalline laminæ, or a whitish, crystalline powder, of faint, phenol-like odor, and sharp taste. Soluble in ¾ of alcohol, in about 1000 of water, and in 75 of boiling water; very soluble in boiling alcohol, ether, chloroform, olive oil and petrolatum. Used as ointment, 1 to 5 for adults, but for children it should be not over 2 per cent. strength.

Hydronaphtol, $C_{16}H_7OH$ (Unofficial),—glistening, micaceous scales, sparingly soluble in water, freely soluble in alcohol, oils, etc. Used as an antiseptic, and in ointment or powder locally, diluted with oxide of zinc, 1 to 50.

Naphtolum Camphoratum, *Camphorated Naphtol*, *Naphtol Camphor* (Unofficial),—is prepared by heating carefully one part of beta-naphtol with two of camphor; the product being a homogeneous, oily fluid, which is .insoluble in water, and decomposes readily on exposure to light and air. Used as a parenchymatous injection, the undiluted fluid being well borne, or in Olive oil, in doses of ♏ij–v.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Naphtalin is destructive to all forms of low life, and hence is antiseptic in a high degree, but must be intimately mixed with the substances upon which it is to act. Internally it is a stimulant expectorant of decided power, and disinfects the contents of the intestinal canal. Being so sparingly soluble but little of it is absorbed, and hence it does no injury to the organism. What is taken up by the blood is excreted by the urine, partly unchanged, partly as naphtol and perhaps some as phenol. Naphtol is more easily absorbed, and may induce vomiting, hematuria, convulsions and unconsciousness. An ointment containing 2 per cent. applied with friction for scabies to two brothers, aged 6 and 8 years respectively, caused nephritis in both and death in one, the diagnosis of nephritis being verified at the autopsy. Hydronaphtol is a powerful and non-irritating antiseptic, non-poisonous, non-corrosive, freely soluble in alcohol, glycerin, fixed oils, etc., in cold water, 1 to 2,000; and in hot water 1 to 100, precipitating as the water cools, but leaving a saturated solution of 1 to 1,000, which is perfectly inhibitive of the germs of putrefaction in all putrescible fluids. The claims made for it are that it is 12 times as effective as carbolic acid, 30 times as potent as salicylic acid, 60 times as efficient as boric acid, 600 times as antiseptic as alcohol, and that it is entitled, as a true antiseptic, to stand next to mercuric chloride in the comparative tables (Levis).

Naphtalin is employed as an antiseptic for the intestinal canal in typhoid fever, diarrhea, both acute and chronic, tubercular diarrhea, dysentery, etc. It renders the urine aseptic and may be employed in vesical catarrh. It is also used internally for humoral asthma, verminous affections, and the chronic pulmonary catarrh of the aged. It has come into prominence as an efficient, all-around anthelmintic, having been given for all kinds of intestinal worms, with prompt and complete results invariably obtained (Mirowicz). In pertussis the best possible results have been obtained from the burning of this agent in the patient's room; giving force to the belief that the well-known benefit resulting from taking children to gas-works for whooping-cough is due to the naphtalin fumes rather than to the gas-tar. Locally, Naphtalin has high value as an antiseptic for indolent ulcers, sloughing wounds, open cancers, pus cavities, etc. Painted over organic remains it effectually prevents the ravages of insects. Naphtol is employed like tar for therapeutic action upon the skin in hyperidrosis, scabies, eczema and local sweating, in ½ to 5 per cent. alcoholic solution, or as a 10 per cent. ointment, but is a dangerous application. Hydronaphtol is also highly esteemed for antiseptic purposes generally by those who have used it, and is of benefit as an external application in many skin diseases. Its non-toxic and non-irritant qualities render it the most useful and most generally available of the three.

Camphorated Naphtol has been employed hypodermically in tuberculous adenitis, with permanent improvement in nine cases, and improvement in six others, out of a series of 32 cases so treated by Reboul, of Marseilles. In five cases of tuberculosis of the testis, so treated by the same observer, very gratifying results were obtained; the injection appearing to be perfectly harmless, and to act beneficially, both locally and generally. It has also been extensively used in the irrigation of joints, bony cavities, tendinous sheaths, cold abscesses in the pleural and uterine cavities, and in tuberculosis of the bladder: all which localities seem to bear the undiluted fluid well. (Squibb.)

NUX VOMICA, Nux Vomica, *Poison Nut, Quaker Button,*—is the seed of *Strychnos Nux-vomica*, a tree of the nat. ord. Loganiaceæ, growing in India, Cochin-China and the neighboring countries, all parts of which are bitter and poisonous. The seeds are flattened and nearly circular, about one inch in diameter, ashy-gray in color, covered with short, satiny hairs, internally translucent, tough and horny, with a large cavity; inodorous, but of intensely bitter taste. They contain the alkaloids *Strychnine* and *Brucine* (see below), in combination with *Igasuri* (or *Strychnic*) *Acid*, also the glucoside *Loganin*, a yellow coloring matter, a concrete oil, gum, starch, wax, and earthy phosphates.

Preparations of Nux Vomica.

Extractum Nucis Vomicæ, *Extract of Nux Vomica,*—has of total alkaloids 15 p cent. Do [illegible] ½, up to a maximum in 24 hours of gr. ij.

[illegible] **Vomicæ Fluidum,** *Fluid Extract of Nux Vomica,*—has 1½ Dose, ♏j–v.

[illegible] nicæ, *Tincture of Nux Vomica,*—has 0.3 per cent. of t

Alkaloids and their Salts.

Strychnina, *Strychnine,* $C_{21}H_{22}N_2O_2$,—is an alkaloid obtained from Nux Vomica, Ignatia, and other plants of the order Loganiaceæ; crystalline, intensely bitter even in 1 to 700,000 solution, of alkaline reaction, soluble in 7 of chloroform, 110 of alcohol, 6700 of water, almost insoluble in ether. It is a constituent of Ferri et Strychninæ Citras, and of Syrupus Ferri Quininæ et Strychninæ Phosphatum. Dose, gr. $\frac{1}{60}$–$\frac{1}{20}$.

Strychninæ Sulphas, *Strychnine Sulphate* $(C_{21}H_{22}N_2O_2)_2H_2SO_4 + 5H_2O$,—crystalline, efflorescent, odorless, of intensely bitter taste, even in 1 to 700,000 solution, neutral reaction, soluble in 50 of water, in 109 of alcohol, and in 2 of boiling water, but almost insoluble in ether. It contains 75 per cent. of Strychnine. Dose, gr. $\frac{1}{60}$–$\frac{1}{12}$, but after tolerance is attained much larger doses may be safely used.

Strychninæ Nitras, *Strychnine Nitrate* (Unofficial),—forms colorless needles of a silky lustre and very bitter taste, soluble in 90 parts of cold water, 3 of boiling water, in 70 of alcohol, and in 26 of glycerin, but insoluble in ether. It contains 84 per cent. of Strychnine, and is preferred to the sulphate for hypodermic use, being less irritant. Dose, gr. $\frac{1}{30}$–$\frac{1}{12}$, or more after tolerance is attained. The Phar. Ger. gives the maximum single dose as gr. $\frac{1}{6}$, the daily maximum as gr. $\frac{1}{3}$.

Strychninæ Hydrochloras, *Strychnine Hydrochlorate* (Unofficial),—is used in the form of Liquor Strychninæ Hydrochloratis (B. P.), which is about a 1 per cent. solution. Dose, ♏v–x.

Strychninæ Arsenis, *Strychnine Arsenite* (Unofficial),—is soluble in 35 parts of cold water, in 10 of boiling water, also in alcohol, less so in ether. Dose, gr. $\frac{1}{60}$–$\frac{1}{20}$, but as it is highly toxic, the initial dose should never exceed the minimum given.

Brucina, *Brucine,* $C_{23}H_{26}N_2O_4$ (Unofficial),—occurs in colorless prisms, pearly flakes or masses, bitter, soluble in 850 parts of water and in 1½ of alcohol. It is separated with difficulty from Strychnine, in many samples of which it occurs as an impurity. It is seldom used. Dose, gr. $\frac{1}{10}$–$\frac{1}{3}$.

Tests for Strychnine and Brucine.

Strychnine and its salts dissolve without color in concentrated Sulphuric Acid, but, on adding to the solution some deoxidizing substance, a play of colors results, *Lead Peroxide* producing a beautiful blue, passing into violet, then red, and finally yellow (Marchand). A minute quantity of *Potassium Bichromate* produces similar results (Otto), while *Ceroso-ceric Oxide* causes a blue, changing to violet and then to a permanent cherry-red. If these tests are carefully applied, as minute a quantity as 1 part in 900,000 of the solution may be detected (Wenzell).

Brucine is detected by the red color which it yields with *Nitric Acid.* Neither Nitric nor Sulphuric Acid colors Strychnine unless Brucine is present as an impurity, a test which distinguishes this alkaloid from several others. Brucine does not decompose *Iodic Acid*, and is thereby distinguished from Morphine.

PHYSIOLOGICAL ACTION.

The action of Nux Vomica is that of its principal alkaloid Strychnine. Externally, the latter is a very powerful antiseptic, but is too poisonous for safe use, and in concentrated solution hypodermically it has a decided irritant action on the tissues. Internally in small doses its bitter quality makes it a good stomachic tonic. Increasing the vascularity of the gastric mucous membrane and promoting the secretion of gastric juice, also the pancreatic and biliary secretions, it aids digestion and sharpens the appetite, but like all other bitter tonics it deranges digestion when used excessively or for a long time. It stimulates the muscular coat of the intestines, increasing peristalsis and thus acts as a purgative, but it restrains the fecal discharges when their frequency is due to atony of the bowel. It stimulates the motor nerve-cells of the spinal cord, the cardiac motor ganglia, the respiratory and vaso-motor centres in the medulla, contracting the arterioles all over the body (though by full doses they are relaxed), also the excitability of the sensory nerves and their terminal elements. The result is that respiration is deepened and quickened, the action of the heart is increased and the blood-pressure raised, the field of vision is enlarged, the sight and hearing are sharpened, and the sense of touch is rendered more acute, but the cerebral convolutions are not affected. Excreted chiefly by the kidneys, it causes increased frequency of urination, and when taken in excess produces spasm of the neck of the bladder. It probably excites some degree of uterine contraction, but undoubtedly promotes menstruation, disposes to sexuality, and provokes erections of the penis.

The most marked feature of the action of Strychnine is the great increase which it causes in the reflex excitability of the spinal cord and other reflex centres, such as the vaso-motor and respiratory centres in the medulla. When the dose is large this increase is so great as to induce convulsions and cause death by asphyxia. After a full dose (gr. $\frac{1}{12}$) the pupils become dilated, the limbs take on jerking movements, respiration becomes spasmodic and the lower jaw stiff, a sensation of cerebral tension may be felt, and sudden shuddering and anxiety follow, the face taking on an unmeaning smile, the *risus sardonicus*. A toxic dose (gr. $\frac{1}{2}$ to gr. ij) produces powerful and characteristic convulsions of a tetanic character. Within an hour after its administration, sometimes after only a few minutes, the patient feels a sudden sense of suffocation and dyspnea, the head and limbs begin to shudder and jerk, the limbs are suddenly stretched out rigidly, with hands clenched and feet arched, then the head is bent backwards and the whole body becomes stiffly arched resting on the head and the heels, the belly tense, the chest muscles fixed and the breathing all but arrested. In the height of the paroxysm the face is dusky and congested, and the eyeballs project. Nearly all the muscles of the body are affected, but those of the jaw are not seriously implicated until near the end, and never so powerfully as in tetanus. The pulse is very rapid and the body-temperature is above normal, but the intellect remains unclouded and the patient often expresses a sense of impending dissolution. After the paroxysm has lasted a minute or two it usually relaxes for a time. In the interval the patient suffers from soreness of the muscles, feels exhausted and sweats profusely, but soon becomes aware that the spasm is returning and may cry out for some one to hold him or to rub his limbs. The convulsions rapidly increase in severity, a breath of wind, the slightest noise, even a bright light, being sufficient to bring them on, and in one the patient may jerk himself out of the bed. At last the respiration stops in the middle of a fit and the heart soon ceases to beat. Death occurs, after two or three hours at most, by exhaustion and asphyxia from tetanic fixation of the muscles of respiration, consciousness being preserved until carbonic-acid narcosis sets in.

Strychnine exalts all the functions of the spinal cord—reflex, motor, vaso-motor, and sensory, the latter being the least affected. It has selective action on the large multipolar ganglia in the anterior columns, which it first stimulates and finally paralyzes by over-stimulation, in this respect illustrating the rule that small and large doses of an active agent act antagonistically to each other. A massive dose seems to destroy the spinal and medullary functions as by a single blow. The spasms of Strychnine may be distinguished from those of tetanus by their intermittency (the latter being constant), by the meaningless smile, the less marked trismus, the absence of a wound, and the rapid course of the symptoms. Thebaine, the tetanizing alkaloid of opium, is also a spinal exaltant, and acts much the same as strychnine.

Strychnine does not directly affect the muscular tissue, the motor nerve-trunks or nerve-endings, or the cerebral convolutions. Occasionally, however, large medicinal doses cause a greatly heightened sensibility of the optic and auditory nerves, so that brilliant lights and loud sounds produce painful impressions; and in a few cases there occurs a true cerebral intoxication resembling a slight degree of drunkenness. It probably affects all the nervous centres in some degree, the sensory, however, much less than the motor and vaso-motor ones. It is to some extent oxidized and destroyed in the body, the remainder being eliminated by the urinary, salivary and cutaneous channels. As it contracts the renal arteries, it hinders its own excretion by the kidneys, and being rapidly absorbed it may accumulate in the system if even a small dose is frequently and continuously administered. It is much more poisonous when injected into the rectum than when swallowed.

The fatal dose of Strychnine is placed by Taylor at gr. $\frac{1}{2}$ to gr. ij for an adult, but recovery has taken place after larger doses, even 7 and 8 grains, cases probably of imperfect absorption, due perhaps to the presence of fat or tannin in the contents of the stomach. A child, aged 2½ years, died in four hours from a dose of gr. $\frac{1}{16}$. After death from this poison cadaveric rigidity is marked, with opisthotonos, clenched hands, and arms flexed across the chest. The muscular rigidity may persist for several months after death. The face is usually pale, but sometimes livid, the internal organs are gorged with dark blood, and the bladder is generally contracted. The cause of death is primarily asphyxia produced by rigidity of the muscles of respiration, with possible factors in spasm of the heart or exhaustion thereof.

On animals Strychnine acts as it does upon man, but in different degrees. Birds, guinea-pigs and perhaps monkeys, are comparatively insusceptible to it, while ruminants are less easily affected than other quadrupeds, and cats resist it singularly. Very minute portions in the soil will destroy the life of growing plants.

Antidotes, Antagonists and Incompatibles.

The antidotes are *Tannic Acid* to form the very insoluble tannate, and *Iodine* in dilute solution, or a soluble Iodide. *Animal Charcoal* should be given freely, also Fats and Oils, to retard absorption. *Potassium Permanganate* has been used successfully after the ingestion of gr. $\frac{3}{4}$ of strychnine without any symptom of strychnine poisoning resulting (Fahr). *Lard* is said to be a good antidote. Evacuation of the stomach should follow the administration of any antidote, and the bladder should be emptied frequently to prevent reabsorption. The most reliable antagonist is *Chloral Hydrate*, of which gr. xxx should be given at once, and doses of gr. xx may be repeated at hourly intervals as long as reflex exaltation continues. *Quiet*, as perfect as possible, is an antagonistic measure of great importance. Other antagonists are Hydrastinine Hydrochlorate, gr. j hypodermically, Nicotine, Chloroform, Amyl Nitrite, Physostigma (dangerous), Veratrum Viride, Oil of Chamomile, and Valerian. Potassium Bromide is antagonistic, but too slow of action to be of service. Curare has been recommended, but its antagonistic value is doubtful.

Incompatibles are Bromides, Iodides and Chlorides, which precipitate the strychnine as a hydrobromide, etc. Strychnine salts in solution are decomposed by Alkalies and their Carbonates, and by Tannic (not by gallic) Acid, but are not affected by ferric salts. Oils and fats retard their absorption.

THERAPEUTICS.

Nux Vomica and its chief alkaloid, Strychnine, are exceedingly useful remedies, having a wide range of therapeutic efficacy. They are chiefly employed as stomachic tonics, and as stimulants to the heart, the respiratory apparatus, and the muscular and nervous systems. As the quantity of strychnine in nux vomica varies greatly, it is best to use the alkaloid when its physiological action is desired, as more definite dosage may be thus obtained. The tincture in 5-drop doses is excellent in atonic dyspepsia and gastric catarrh, especially in drunkards, and in constipation from atony of the bowels it may be given in 10-drop doses with good results, not as a purgative but to increase peristalsis. The extract is much used in laxative pills for habitual constipation. In the vomiting of pregnancy the tincture is frequently an efficient remedy, and in the vomiting of phthisis Strychnine is one of the very best agents. In the condition clinically known as that of torpid liver, where the stools are of pale color and very offensive odor, showing absence of bile therein, the tongue coated with a thick, perhaps yellowish fur, and the patient complaining of headache, lassitude, anorexia, and a bad taste in the mouth, small doses of Strychnine (gr. $\frac{1}{60}$) twice or thrice daily will frequently act as well as a mercurial, restoring the bile to the stools, and correcting the other symptoms. Epidemic diarrhea and
ery are often controlled by Strychnine, and in anemia and chlorosis
nvaluable remedy, especially when combined with iron and qui-
n intermittents, as an adjunct to quinine it is always useful, and

in neuralgia, especially of the viscera, and infraorbital and other forms accompanying anemia and general debility, it is highly efficient, but in these affections very small doses (gr. $\frac{1}{100}$) should be employed.

Headaches are often controlled by Nux Vomica, especially the sick headache of gastric origin, in which minim-doses of the tincture every ten or fifteen minutes frequently give marked relief, and a dose of ♏ x before each meal will prevent frontal headache in many persons liable thereto. A sense of heat and weight on top of the head, accompanied or not by flatulence, and usually occurring in women at the climacteric, will often yield to the tincture in doses of ♏ v before each meal. Its undoubted influence on the pneumogastric makes it a valuable remedy for many kinds of cough, even those of phthisis, bronchitis, pneumonia or emphysema, but it is particularly efficient in coughs of neurotic origin, such as periodical cough, night cough, and the paroxysmal laryngeal cough without lung or bronchial symptoms, but characterized by a persistent tickling sensation in the throat. In all these drop-doses of the tincture frequently repeated are more serviceable than larger doses at longer intervals. In bronchial asthma and asthma of neurotic origin, in the dyspnea of pulmonary affections and that with cardiac palpitation in hysterical subjects, in irregular action and over-action of the heart, in functional anesthesia, hypochondriasis, abdominal cramps, nervous movements accompanying pregnancy, cold hands and feet due to languid capillary circulation, prolapsus ani and urinary incontinence in children, and paralysis of the bladder in old people, small doses of Strychnine frequently repeated are remarkably beneficial. In many of these affections the therapeutic action of the drug is unmistakably that of an antispasmodic, illustrating the opposite effects of large and small doses of an active agent, a thoroughly established fact in many cases, though not a universal one.

Nux Vomica is a most efficient remedy in impending cardiac failure from almost any cause. Even with the pulse imperceptible, the extremities cold, and death apparently imminent, the administration of a drop of the tincture every five minutes has frequently given renewed strength to the cardiac contractions after five or six doses, and initiated an improvement which resulted in eventual recovery. Local paralyses of various forms are well treated by the hypodermic injection of Strychnine into the substance of the affected muscles, and diphtheritic paralyses are almost invariably cured by its internal administration. It may prove useful in hemiplegia when degeneration has not set in, and when the paralyzed muscles are completely relaxed; but it is of no avail in recent cases or when electrical contractility is lost. If used early in cerebral paralyses, especially when due to hemorrhage, it may do serious harm; and in the early stage of organic spinal lesions it may be decidedly injurious, particularly if given in large doses. It should never be used in spinal paralysis when there are symptoms of congestion or inflammation of either the cord or its membranes. In hysterical paralysis and that caused by lead it is decidedly beneficial, and also in the form which is limited to one or two groups of muscles, especially infantile paralysis of long standing, even when the atrophic process has gone so far as to greatly impair the electrical sensibility. In multiple peripheral neuritis the hypodermic injection of strychnine has proved eminently serviceable.

Strychnine is very useful in cases of nervous impairment of the sight, especially in amblyopia from lead, tobacco or alcohol, from atrophy of the optic nerve, and from functional disorders of the retina without apparent lesion, also in muscular asthenopia. In these affections it may be used internally, but it is usually administered by injection into the tissues around the temple, beginning with gr. $\frac{1}{40}$, and gradually increasing the dose up to gr. $\frac{1}{8}$ or $\frac{1}{6}$. Improvement may not be apparent until the larger doses are reached.

In acute and chronic alcoholism, Strychnine is undoubtedly of great service. In small doses it is an effective remedy for the morning vomiting and dyspepsia of drunkards, for the tremor of chronic dipsomaniacs, in the forming stage of delirium tremens, and for the depression due to enforced abstinence from alcohol. The nitrate, in doses of gr. $\frac{1}{30}$ to $\frac{1}{20}$, hypodermically three or four times daily for a week, and less frequently for two weeks longer, removes the craving for stimulants, counteracts the vaso-motor paralysis to which most of the injurious effects of alcohol are due, and is probably in other respects a true antagonist to the action of that narcotic poison on the human organism. The published reports of its efficacy in dipsomania, by Luton, Dujardin-Beaumetz, Portugaloff and others, have been fully confirmed by other observers, so that Strychnine is now the acknowledged remedy for inebriety, and the efficient constituent of the numerous "cures" therefor so widely advertised in the religious and secular press.

Strychnine is a physiological antagonist to Chloral, Physostigmine and Morphine, and may be used as a respiratory stimulant in poisoning by these drugs, also in narcotic poisoning by any agent when the respiration is failing. It has been employed in Australia as an antagonist to serpent venom with great success in the hands of Mueller and others, and with [illegible] doubtful efficacy in the experience of many observers. From the results of experiments made by Dr. Elliot, of the Indian army, it would seem that its use in poisoning by cobra venom is of no service whatever and may actually hasten death.

Strychnine Arsenite possesses strong antiperiodic power, and may prove to be an efficient remedy for any intermittent disease which proves rebellious to the influe[illegible] As it is a highly toxic agent, the minimum dose (gr [illegible] be exceeded at its first administration, and its effects should be carefully watched upon repetition of the dose.

Brucine was formerly supposed to have an action analogous to that of strychnine though weaker. Dr. Mays has shown that pure Brucine is a powerful local anesthetic in 5 to 10 per cent. solutions on mucous membranes, and in a 20 per cent. solution on the skin. In the latter strength its solutions have been employed with satisfaction for chronic pruritus, and in a weaker solution (5 per cent.) for inflammations about the external ear, in which Dr. Burnett claims for it more satisfactory results than are obtained with cocaine.

NYMPHÆA ODORATA, Sweet-scented Water-lily (Unofficial),—is a well-known American plant of the nat. ord. Nymphæaceæ, the root of which is very bitter and highly astringent, containing much Gallic and Tannic Acids, to which its actions and uses are due. A decoction of ℥j to the pint may be used in doses of ℥ss-j, or a fluid extract in doses of ʒss-j. For the physiological actions and therapeutics of this vegetable astringent see under ACIDUM TANNICUM.

OLIVÆ OLEUM, Olive Oil, *Sweet Oil, Salad Oil,*—is a fixed oil expressed from the ripe fruit of *Olea europæa*, the olive tree (nat. ord. Oleaceæ), which is cultivated in southern Europe, California and Australia. It is a pale-yellow or greenish-yellow oily liquid, of nutty, oleaginous taste and neutral reaction, sparingly soluble in alcohol but readily soluble in ether. Sp. gr. about 0.916. Dose, ℥ss–j.

Olive Oil consists of 72 per cent. of *Olein* (a fluid oil) and 28 per cent. of *Palmitin* (a solid oil or stearopten), which are compounds of the base *Glyceryl*, C_3H_5, with *Oleic Acid*, $C_{19}H_{34}O_2$, and *Palmitic Acid*, $C_{17}H_{31}O_2$, respectively. It is frequently adulterated with cheaper fixed oils, especially poppy oil, lard oil, and cotton-seed oil, quantities of the latter being exported every year to Italy, whence it is returned to us as Olive Oil under a French label. (See GOSSYPIUM.) It is an ingredient of Ceratum Cetacei, Emplastrum Plumbi and Unguentum Diachylon, and is the source of the official Soap.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Externally used Olive Oil is a good protective from the air, and renders the skin soft and flexible. If rubbed into the integument it is absorbed by the lymphatics and is directly nutritive in effect. Internally it is also nutritious and mildly laxative, and in quantity acts as a protective to the mucous membrane against acrid or poisonous substances. Like other oils it is partly emulsified, partly saponified in the intestines, its glycerin being set free and its fatty acids combining with the free alkalies to form soap, which with the emulsion forms the molecular basis of the chyle, entering the blood through the lacteals and being finally oxidized into carbonic acid and water, though an excess will appear unchanged in the
ls are therefore a food within certain limits, increase the fat of
rnish heat and force, and lessen the waste of nitrogenous
nable of themselves to support life.

Olive Oil possesses no very marked therapeutic power over any other bland oil or fat. It is a good laxative for infants administered internally, and may be used as an enema followed by warm water. There is much clinical evidence to prove that administered internally it is a very efficient remedy in both nephritic and biliary colic, but how it acts therein has not been explained. It is chiefly employed as a local application. Applied to burns and acute inflammatory affections of the skin it is an excellent protective, coating the surface and excluding the air; and as an ingredient of liniments it acts as a diluent for more active agents. It is used to facilitate friction over enlarged or stiff joints, and in the desquamative stage of scarlet fever is a very useful and grateful application. As an antidote in corrosive poisoning it acts mechanically by protecting the mucous membrane of the stomach and preventing absorption. In pharmacy its bland, unirritating qualities have procured its common employment as an ingredient of liniments, plasters, ointments and cerates, but the foreign article is so frequently adulterated with inferior oils that Cotton-seed Oil is now directed in its place in many official preparations.

OPIUM,—is the concrete, milky exudation, obtained by incising the unripe capsules of the White Poppy, *Papaver somniferum*, an annual herb of the nat. ord. Papaveraceæ, indigenous to Western Asia, but cultivated extensively elsewhere. Its capsules are globular, two or three inches in diameter, and are crowned by a sessile, stellate stigma, which distinguishes them from Colocynth and Bael fruits. Opium occurs in irregular lumps or cakes, of dark-brown color, sharp, narcotic odor, and bitter taste; and in its normal, moist condition should yield not less than 9 per cent. of Morphine when assayed by the official process.

Composition of Opium.

Opium contains 17 alkaloids, 2 neutral substances and 2 organic acids, together with sugar, gum, resin, pectin, extractives, odorous principles, water and other constituents of plants. Its most important alkaloids are the following:—

Morphine, $C_{17}H_{19}NO_3$,—5 to 20 per cent.,—the principal alkaloid, occurring in the drug in the form of the tribasic meconate. Its properties are anodyne, hypnotic and narcotic. From it by a process of dehydration by heat and hydrochloric acid is prepared the artificial alkaloid *Apomorphine*, a powerful emetic and expectorant.

Codeine, $C_{18}H_{21}NO_3$,—0.3 to 0.5 per cent.,—is calmative and when pure a not very active alkaloid, but is frequently contaminated with other alkaloids. *Apomorphine* may be prepared also from it.

Narcotine, $C_{22}H_{23}NO_7$,—2 to 10 per cent.,—is antiperiodic and a tetanizer, but wholly devoid of narcotic properties.

Thebaine, or *Paramorphine*, $C_{19}H_{21}NO_3$,—0.15 to 0.20 per cent.,—is a powerful spinal exaltant and tetanizer, resembling Strychnine in its action.

Narceine, $C_{22}H_{29}NO_9$,—0.02 per cent.,—closely resembles Morphine in action, but is probably more hypnotic, and is not followed by many of the disagreeable after-effects of Morphine. It is extremely difficult to obtain this alkaloid pure.

Papaverine, $C_{21}H_{21}NO_4$,—1 per cent.,—is reported inert on man by some observers, a narcotic and convulsant by others.

Other Alkaloids at present acknowledged are—Cryptopine, Pseudomorphine, Protopine, Hydrocotarnine, Laudanine, Codamine, Rhœadine, Meconidine, Laudanosine, Lanthopine and Gnoscopine. Many of them are probably to be regarded as derivatives of Morphine.

Acids and Neutral Principles.

Acids are—*Meconic Acid*, $C_7H_4O_7$, 4 per cent., and *Lactic Acid*, $C_3H_6O_3$, 1¼ per cent., which exist in combination with the alkaloids as meconates, etc. The second acid is generally called *Thebolactic*, but has been shown to be identical with lactic acid.

Neutral Principles are—*Meconin*, $C_{10}H_{10}O_4$, 0.01 per cent., is white, crystalline, neutral, but very acrid; *Meconoiosin*, $C_8H_{10}O_2$, also crystalline, and *Porphyroxin*, which is said to be a very complex combination of several opium alkaloids and not a proximate principle.

Official Preparations of Opium.

Opii Pulvis, *Powdered Opium*,—is Opium dried at a temperature not exceeding 185° F., and reduced to a very fine powder. It should contain not less than 13 nor more than 15 per cent. of crystallized Morphine, when assayed by the official process. Dose, gr. ss–iij, an average adult dose being about 1 grain.

Opium Deodoratum, *Deodorized Opium, Denarcotized Opium*,—is powdered Opium freed from the constituents thereof which are soluble in Ether, namely Narcotine and the odorous principles, which are supposed to cause the unpleasant after-effects of the drug. It should yield 14 per cent. of Morphine, and is a good preparation, being a purified opium with a fixed morphine standard. The proprietary article named *Svapnia* is a similar preparation. Dose, gr. ss-iij; an average adult dose being about 1 grain.

Extractum Opii, *Extract of Opium*,—an aqueous extract containing 18 per cent. of Morphine, and freed from principles insoluble in water. Dose, gr. ¼–ij.

Pilulæ Opii, *Pills of Opium*,—each pill contains about gr. j of powdered Opium incorporated with Soap. Dose, j–iij pills.

Tinctura Opii, *Tincture of Opium, Laudanum*,—Opium-strength 10 per cent., average Morphine-strength gr. vj (equalling gr. vijss of the Sulphate) to the fl ℥. Has about gr. xliv of Opium to the ℥. ♏xj (gtt. xxij) = gr. j of Opium or gr. ⅙ of Morphine Sulphate. Sixty minims yield on the average 120 drops. Dose, ♏v–xxx, according to the effect desired.

Tinctura Opii Deodorata, *Tincture of Deodorized Opium*,—an aqueous extract is prepared and shaken with ether, which being separated the residue is dissolved in water, and enough alcohol is added to preserve it. An excellent liquid preparation, being freed from all the noxious and useless ingredients soluble in alcohol and ether. Opium-strength 10 per cent., average Morphine-strength gr. vj to the fl ℥. Dose, as of Tinctura Opii. Drops of this preparation nearly equal minims. *McMunn's Elixir* is a similar preparation, so also is another proprietary nostrum named *Papine*.

Vinum Opii, *Wine of Opium, Sydenham's Laudanum*,—Opium-strength 10 per cent., with the aromatics Cinnamon and Cloves of each 1 per cent., in Alcohol and White Wine. A vinous tincture decreased somewhat in strength from the wine of 1870. Dose, as Tinctura Opii. Drops of this preparation are larger than those of the tincture.

Acetum Opii, *Vinegar of Opium, Black Drop*,—Opium-strength 10 per cent., with Nutmeg and Sugar in Dilute Acetic Acid. Is now ⅓ weaker than formerly, having the same strength and dose as Tinctura Opii.

Tinctura Opii Camphorata, *Camphorated Tincture of Opium, Paregoric*,—has of Powdered Opium 4, Benzoic Acid 4, Camphor 4, Oil of Anise 4, Glycerin 40, Diluted Alcohol to 1000. ℥ss contains nearly one grain of powdered Opium. It is about $\frac{1}{20}$th the strength of Laudanum. Dose, for an infant gtt. v–xx, for an adult ʒj–iv. Is an ingredient of Mistura Glycyrrhizæ Composita.

Emplastrum Opii, *Opium Plaster*,—contains of Extract of Opium 6 parts, Burgundy Pitch 18, Lead Plaster 76, Water 8.

Pulvis Ipecacuanhæ et Opii, *Powder of Ipecac and Opium, Dover's Powder*,—has of Ipecac 10, Powdered Opium 10, Sugar of Milk 80, rubbed together into a very fine powder. Dose, gr. v–xv; ten grains equalling 1 grain each of Ipecac and Opium.

Tinctura Ipecacuanhæ et Opii, *Tincture of Ipecac and Opium*,—has of Tincture of Deodorized Opium 100 evaporated to 80, Fluid Extract of Ipecac 10, Diluted Alcohol to 100. Is intended to represent Dover's Powder in liquid form. Dose, ♏v–xv.

Trochisci Glycyrrhizæ et Opii, *Troches of Glycyrrhiza and Opium*,—each troche contains of powdered Opium gr. $\frac{1}{12}$, with Extract of Glycyrrhiza, Acacia, Sugar and Oil of Anise. Dose, j–iv troches.

[Note.—According to the U. S. Pharmacopœia of 1890 the official dried Opium should contain 13 to 15 per cent. of Morphine instead of 10 per cent. as required by the Pharmacopœia of 1870. The liquid preparations, except Paregoric, are now directed to be of the uniform Opium-strength of 10 per cent., and to yield, on being assayed, 1.3 to 1½ per cent. of crystallized morphine, making the Wine less strong by 2 per cent., the Acetum fully ⅓ less in strength, and the other liquid preparations stronger by ⅓ in Morphine than formerly. So that if the full anodyne dose of Tincture (1870) be taken at 24 minims, equalling gr. ¼ of Morphine Sulphate, the corresponding dose under the present system will be 16 minims.]

Official Preparations of Morphine.

Morphina, *Morphine*, $C_{17}H_{19}NO_3 + H_2O$,—white, prismatic crystals, or fine needles, or a crystalline powder, odorless, of bitter taste and alkaline reaction, almost insoluble in water, soluble in 300 of alcohol. Its comparative insolubility makes the salts preferable for use, and as a very small proportion of acid neutralizes it, the dosage is about the same for the alkaloid and its salts, viz., gr. $\frac{1}{20}$–gr. j. Gr. $\frac{1}{4}$–$\frac{1}{6}$ is about equal to one grain of Opium of medium Morphine-strength. [Compare *Morphinæ Sulphas*, below.]

Morphinæ Acetas, *Morphine Acetate*,—a white, crystalline or amorphous powder of faintly acetous odor, bitter taste, neutral or faintly alkaline reaction, soluble when fresh in 2½ of water and in 47.6 of alcohol at 59° F. Dose, gr. $\frac{1}{20}$–j.

Morphinæ Hydrochloras, *Morphine Hydrochlorate*,—white, feathery crystals of silky lustre, of bitter taste and neutral reaction, soluble in 24 of water and in 62 of alcohol at 59° F. Dose, gr. $\frac{1}{20}$–j.

Morphinæ Sulphas, *Morphine Sulphate*,—white, feathery, acicular crystals of silky lustre, of bitter taste and neutral reaction, soluble in 21 of water and in 702 of alcohol at 59° F., and in 0.75 of boiling water. Contains about 80 per cent. of Morphine. Dose, gr. $\frac{1}{20}$–gr. j; $\frac{1}{20}$–⅛ being a small dose for an adult, ⅛–¼ a moderate one, ¼ to ½ a full dose, and ½–j a large one.

Pulvis Morphinæ Compositus, *Compound Powder of Morphine, Tully's Powder*,—has of Morphine Sulphate 1 part to 19 of Camphor and 20 each of Liquorice and Calcium Carbonate. A similar preparation to Dover's powder minus the Ipecac. Dose, gr. v–xv, ten grains containing gr. ⅙ of Morphine Sulphate.

Trochisci Morphinæ et Ipecacuanhæ, *Troches of Morphine and Ipecac*,—each has gr. $\frac{1}{40}$ of Morphine Sulphate with gr. $\frac{1}{12}$ of Ipecac, also Sugar, Oil of Gaultheria and Mucilage of Tragacanth. Dose, one every hour or so; cautiously with children.

Injectio Morphinæ Hypodermica, *Hypodermic Injection of Morphine* (B. P.),—is a solution of the Acetate, containing gr. j in each ten minims, being thrice as strong as Magendie's solution. Dose, ♏j–iij.

Tinctura Chloroformi et Morphinæ, *Tincture of Chloroform and Morphine*, (B. P.),—a substitute for Chlorodyne. See *ante*, page 261 and also the table on Chlorodyne in the Appendix.

Unofficial Preparations of Opium and Morphine.

Liquor Opii Compositus, *Compound Solution of Opium* (Squibb),—has the same strength as the official tinctures, namely gr. vj of Morphine (equalling gr. vijss of the Sulphate) to each fluidounce. ♏xvj = gr. ¼ of Morphine Sulphate.

Tinctura Opii Composita, *Compound Tincture of Opium, Squibb's Diarrhea Mixture*,—has of Tinct. Opii, Spt. Camphoræ and Tinct. Capsici ℥j of each, Purified Chloroform ʒiij, Stronger Alcohol q. s. ad ℥v. Each fl ʒ or teaspoonful contains about 100 drops or ♏xij of each of the first three ingredients and ♏ivss or 18 drops of Chloroform. Dose, for infants gtt. j–x, for children gtt. x–xxx, for adults ʒss–j.

Liquor Morphinæ Sulphatis, *Solution of Morphine Sulphate, Magendie's Solution*,—has gr. xvj of Morphine Sulphate in each fl ℥, or gr. j in ♏xxx, or gr. ¼ in ♏vijss. If made with Benzoic Acid, the solution will not spoil, and is not irritant hypodermically. The same result is attained by adding of Carbolic Acid, ♏iij to the ℥.

Oleatum Morphinæ, *Oleate of Morphine*,—Morphine-strength 10 per cent. with Oleic Acid 90. For local use.

Liquor Opii Sedativus, *Sedative Solution of Opium, Battley's Sedative*,—is about 50 per cent. stronger than Tinct. Opii. It was formerly a favorite preparation.

Dalby's Carminative,—contains Opium, about gr. ⅙ to the ounce, also Oil of Peppermint, Nutmeg, Anise, and Magnesium Carbonate.

Godfrey's Cordial,—contains Laudanum, Sassafras and Treacle, its opium strength being gr. ½ to the ounce.

Nepenthe,—is a purified alcoholic solution of Morphine Meconate in sherry wine.

Chlorodyne,—(see *ante*, page 261, and Appendix), contains Morphine in varying proportion, that of J. Collis Browne having gr. vj to the ounce.

Mrs. Winslow's Soothing Syrup,—contains Morphine, with Essence of Anise and Syrup of Tolu. After years of persistent denial, its proprietors have admitted that it contains ⅛ grain of Morphine in each fluidounce (Squibb).

Derivatives of Morphine.

Apomorphinæ Hydrochloras, *Apomorphine Hydrochlorate*, $C_{17}H_{17}NO_2HCl$,—is the hydrochlorate of an artificial alkaloid (Apomorphine) which is prepared from morphine or codeine by the action of strong acids or zinc chloride, the morphine losing in the process a molecule of water. The Hydrochlorate occurs in minute, colorless crystals, odorless, of bitter taste, and neutral or faintly acid reaction; soluble in about 45 of water and in the same quantity of alcohol at 59° F., almost insoluble in ether or chloroform; decomposed by boiling water or boiling alcohol. Dose, gr. 1/20 to 1/10 hypodermically, gr. 1/10 to ⅙ by the mouth. For young children, gr. 1/60 to 1/30 should not be exceeded. Solutions should be fresh when used, and as they alter rapidly by keeping should have a few drops of hydrochloric acid added to them, to prevent decomposition.

Peronine, *Benzyl-morphine*, (Unofficial),—is the hydrochloride of the benzyl ether of morphine, and occurs as a white powder, soluble in water, insoluble in alcohol, chloroform or ether. It produces sound sleep without previous excitement, and has been useful in allaying cough, also in relieving rheumatic and neuralgic pains. It is almost free from the by-effects of morphine. Dose, gr. ⅓–j in pill or in aqueous solution.

Heroine, *Diacetyl-morphine*, (Unofficial),—is an acetic ester of morphine and occurs as a fine, white powder, insoluble in water but soluble in dilute acids. It resembles codeine in its effects but has a stronger action on the respiratory centre. It has been very efficient in coughs, pain in the chest and catarrhal affections of the respiratory tract (Dreser). Dose gr. 1/15–⅙ in pill or powder, or in aqueous solution with a few drops of diluted acetic acid.

Dionine, (Unofficial),—is the hydrochloride of the mono-ethyl-ester of morphine, and occurs as a white, crystalline powder, very soluble in water and may be used hypodermically. It possesses some of the narcotic properties of morphine without its intensity, and is recommended in the treatment of the morphine habit, since tolerance is not established by its continued use. It has been employed against cough in phthisis, bronchial affections and pneumonia. Dose, gr. ⅓–j.

Other Alkaloids and their Preparations.

Codeina, *Codeine*, $C_{18}H_{21}NO_3 + H_2O$,—white or yellowish-white, rhombic prisms, efflorescent in warm air, of bitter taste and alkaline reaction, soluble in 80 of water and in 17 of boiling water, very soluble in alcohol, chloroform and ether. This alkaloid is official. Dose, gr. ¼–jss, but gr. ⅙ has caused alarming symptoms in children. Much of the so-called codeine in the market consists largely of morphine.

Codeinæ Phosphas, *Codeine Phosphate,* (Unofficial),—white crystals of slightly bitter taste, soluble in 4 of water and in 200 of alcohol. Is the most soluble salt of codeine and comparatively unirritant, hence it is well suited for hypodermic use in solution of 1 part in 20 of water. Dose, gr. ¼–jss.

Syrupus Codeinæ, *Syrup of Codeine,* (Unofficial),—has of Codeine Phosphate gr. xxxij, dissolved in Distilled Water ʒ ijss, adding Syrup to ℥ xvj. Of this ʒ j contains gr. ¼ of Codeine Phosphate. Dose, ʒ j–iv.

Narcotinæ Hydrochloras, *Narcotine Hydrochlorate,* (Unofficial),—Dose, gr. ij–x, as an antiperiodic.

Children bear Opium badly, and for them its proportionate dosage should be much below that for other agents. Morphine should not be given to children below 10 years of age, and never hypodermically to those beneath the age of 15. Opium given to a nursing mother will affect the child, being partly excreted in the milk.

Reactions and Incompatibles.

An aqueous or alcoholic preparation of Opium reddens litmus paper (free meconic acid); gives a deep red color with Ferric Chloride (meconic acid); forms precipitates with Lead Acetate, Silver Nitrate, Zinc, Copper, and Arsenic (meconates, sulphates, and coloring matter); forms a precipitate with tincture of Galls or astringent preparations (tannates of morphine and codeine); and becomes turbid with the fixed Alkalies, Carbonates, Alkaline Earths, and Ammonia (precipitated morphine and narcotine).

Tests for Morphine.

Nitric Acid produces an orange-red color, turning yellow, then disappearing. Test-solution of *Ferric Chloride* gives a blue color changing to green with excess of the reagent, and destroyed by free acids or alcohol, but not by alkalies. *Iodic Acid* liberates Iodine which may be tested by starch. Vaughn has shown that certain intestinal ptomaines will give the same reactions with these reagents.

PHYSIOLOGICAL ACTION.

Opium is analgesic, hypnotic, antispasmodic, diaphoretic and narcotic. It first stimulates and afterwards depresses the cerebrum, heart and respiratory apparatus, and is classed among the cerebral depressants.

In medium dose (gr. j) it arrests all the secretions except the milk and sweat, the latter being increased; producing dryness of the mouth and throat, retarded digestion from decrease of the gastric juice, and decided loss of appetite. The action of the heart is increased, arterial tension is raised and the pupils are slightly contracted. The cerebral faculties are stimulated to a pleasant activity by increased blood supply, ideas follow each other rapidly through the mind, and an exhilaration bordering on mild intoxication is experienced, succeeded by a calm of variable length. Sleep generally follows, disturbed by dreams, and after waking, headache, malaise, constipation, digestive disturbance and some depression result. The conductivity of the nerves is not affected. Frequently the stage of mental activity is absent, but in persons habituated to the use of Opium it is usually well marked. In some subjects a lengthened period of calm repose takes the place of sleep, in others neither calm nor sleep occurs, but the stimulant action of the drug prevails, the spinal functions as well as the cerebral are exalted, and great restlessness results.

In full dose (gr. iij–v) the same symptoms are produced but in greater intensity; the stage of stimulation is much shorter, digestion is arrested, nausea and vomiting produced, also profuse diaphoresis. The conductivity of the nerves is more or less impaired, the heart and circulation depressed, oxidation being interfered with and the body-temperature lowered. The pupils are contracted by stimulation of the motor oculi through the basal ganglia, intense pruritus is produced, especially at the nose, and often spasmodic retention of the urine. Profound sopor soon comes on, with irregular and slow respiration, but in some subjects this is replaced by coma-vigil and delirium. After-effects are nausea, depression, constipation, racking headache, vertigo, anorexia, nasal pruritus, and fetid pathological secretions.

A toxic dose produces cold and clammy sweat, very slow pulse, slow and stertorous respiration gradually becoming feeble and irregular, cyanosed face, abolished reflexes, coma gradually deepening, the pupils minutely contracted but dilating as the end approaches, and finally death by paralysis of the respiratory centre due to direct action on the medulla. Post-mortem examination shows only a wet brain, congested lungs, and engorgement of the venous trunks and of the right heart.

The coma produced by opium-narcosis, when deep and when a history of the case cannot be obtained, is almost impossible of differential diagnosis from that due to alcohol, apoplexy, uremia, epilepsy, etc. [See under ALCOHOL, *ante*, page 137.] *The odor* of the breath may point to laudanum or some other preparation of opium. *The pupils* are very much contracted in opium poisoning (also from physostigma and chloroform), but they may dilate just before death (as with chloroform), due to the irritation of the centres by the excessive venous condition of the blood. In alcoholic coma they may be either contracted or dilated; and in apoplexy they are generally contracted unequally, though in apoplexy of the pons varolii they may be equally and minutely contracted. *The rectal temperature* may be an important sign, for in most cases of apoplexy there is an initial fall of temperature with a subsequent rise. A previous history of *convulsions* points to epilepsy, and the presence of *albumin* in the urine, with sometimes edema of the legs, indicates uremia as the cause of the coma.

The principal action of Opium is exerted upon the nervous system, first affecting the cerebral convolutions, which are briefly stimulated and soon depressed. Next the perceptive and sensory centres in the higher brain are blunted, and the conductivity of the afferent nerves is impaired. Soon the ganglia at the base of the brain are involved, evinced by the contraction of the pupils, vomiting, and slowing of respiration; the cardiac, vascular and other centres are depressed, but to a less degree than the respiratory and perceptive. The gray matter of the cord, at first stimulated, as shown by the increase of reflex excitability, is also depressed, and locomotion becomes difficult, the motor nerves being paralyzed from the centre outwards, but muscular irritability is never lost. Death occurs generally by paralysis of the respiratory centre, rarely by sudden cardiac failure.

Metabolism is greatly reduced in activity by Opium, the quantity of urea excreted being markedly lessened, and the biliary and glycogenic functions of the liver being affected, resulting in whitish stools, perhaps jaundice, and certainly decided decrease of the sugar excreted by diabetics when the drug is given to them by the stomach.

The vaso-motor centre is slightly, if at all, affected by small doses of Opium, but large doses paralyze it. On the vessels of the skin the first effect of the drug is to cause their dilatation, shown by turgescence of the vessels of the external ear and a sense of heat therein, and often giving rise to a roseolous cutaneous eruption accompanied by itching. The long-continued use of opium causes a marked contraction of the capillaries and arterioles throughout the body, the skin is excessively pale and the subject always feels cold at the ordinary temperature of the atmosphere.

On the uterine and generative functions Opium exerts a marked influence, stopping menstruation if its use be continued, and in men causing impotence. Both male and female functions, however, return as soon as the drug is discontinued, but the female organs of generation suffer atrophy from its long-continued use. In one case, intra-uterine measurements, taken during a period of two years, showed a diminution in the size of the cavity from 5.1 to 1.9 inches.

The hypnotic action of Opium is now believed to be produced by a double influence, (1) on the vascular system, causing anemia of the brain, (2) on the cerebral cells, diminishing their activity, and consequently lessening their demand for blood. Its constipating action is shown experimentally to be produced by stimulation of the inhibitory nerves of the intestines through the splanchnics.

Morphine was discovered by Sertürner in 1817. Its action is generally similar to that of Opium, it being the principal alkaloid therein, but when used by itself its influence is not complicated with the effects of the convulsive alkaloids (thebaine, codeine and narcotine) which must influence the action of opium to a considerable degree. As compared with the latter, Morphine acts more quickly, and for a shorter time, has less influence on the intestines and skin, is less constipating, less stimulating, less convulsant and less diaphoretic, but more sedative, more anodyne and hypnotic and produces more intense pruritus. Its elimination commences quickly but may not be completed for as much as 48 hours, and is effected by the intestines, the urine, and the salivary glands. It is also eliminated by the gastric mucous membrane, and constantly reappears in the stomach until finally excreted. When injected hypodermically more than one-half the amount administered may be recovered by repeatedly washing out the stomach. It is probably retained in the organism to a great extent when the action of the kidneys is defective, and when given continuously in renal disease may accumulate with fatal result.

Apomorphine in dose of gr. $\frac{1}{10}$ given hypodermically is a systemic emetic, acting directly on the vomiting centre, and is the quickest, most certain and least irritating of all emetics, acting in from five to twenty minutes with but moderate nausea. In large dose it is very depressant to the heart, gr. $\frac{1}{15}$ having caused death in a weak adult by cardiac failure, and produces paralysis of the motor and sensory nerves, delirium, convulsions, and depression of respiratory power. Small doses (gr. $\frac{1}{30}$) given by the mouth are expectorant, and the same quantity, administered hypodermically, is said to have a hypnotic effect lasting from one to two hours. Morphine in solution kept for a long time may become changed into Apomorphine.

Codeine differs chemically from Morphine in having the radicle methyl (CH_3) replacing an atom of hydrogen, and may be considered a methyl-morphine. Like all methyl compounds it possesses motor-paralyzant power, like that of Curare. On man it has some hypnotic action, but far less than that of morphine. It exalts the spinal cord more than morphine does, producing muscular tremor in excess of its sedative action. It has a special sedative influence on the pneumogastric nerve, contracts the pupils, and is remarkably analgesic to the nerves of the abdominal and pelvic viscera. When administered for several consecutive days it lessens the irritability of the digestive tract to such an extent that arsenic produces neither vomiting nor purging (Murrell). It markedly reduces the amount of sugar excreted by diabetics, but has no advantage over morphine in that respect.

Narcotine should be named Anarcotine, as it has little or no narcotic power. It is a convulsant in animals and an antiperiodic in man.

Narceine is said by some observers to be remarkably hypnotic, and free from convulsant action—by others equally deserving of credit it is considered almost inert. This alkaloid is difficult to obtain pure, hence the samples heretofore used have probably been contaminated with other alkaloids. It is said to possess laxative properties.

Thebaine is a powerful convulsant, exalting the spinal cord almost like Strychnine and Brucine. It is not used medicinally.

Cryptopine is said to dilate the pupils, a remarkable property if true.

Fatal Doses.

In a child one day old ♏j of Laudanum caused death. A medicinal dose given to a nursing mother proved fatal to the infant. A few drops of Paregoric have killed a child of nine months. In the adult gr. ⅙ of Morphine in one case, and gr. iv of crude Opium in another, have proved fatal.

Antidotes, Antagonists and Treatment of Poisoning.

Potassium Permanganate is the best antidote to Opium or Morphine in the stomach, given in dose about one-half greater than the quantity of morphine present, and repeated in less quantity from time to time in cases where the poison has been administered hypodermically so as to neutralize the morphine excreted by the gastric mucous membrane. If an Opium preparation has been taken, or the alkaloid Morphine itself, Vinegar should be added to the permanganate solution in order to convert the alkaloid into a soluble salt. [For other antidotes see Part III.] *Atropine* antagonizes the cerebral action of Morphine, also its action on the pupils, respiration, heart and arterial tension, but if given too freely will endanger the case by substituting Belladonna-narcosis for Opium-narcosis; gr. $\frac{1}{120}$ hypodermically every fifteen minutes for three doses, is generally sufficient. It is unsafe to be guided in this respect by the pupils. *Caffeine* is also physiologically antagonistic, and is generally used in the form of strong black coffee frequently administered.

The Chief Indications in opium or morphine poisoning are—to antidote any of the poison in the stomach, and to wash out that viscus repeatedly at short intervals, to maintain respiration and keep up the circulation. [See the article on POISONING in Part III.] *Strychnine* is an efficient antagonist to the respiratory paralysis, and may be used in lieu of Atropine, or in connection therewith. *Amyl Nitrite* should also be used when the heart shows signs of failure. *Capsicum*, the tincture, ℥ss–j by injection into the rectum, is said to give almost instantaneous results in antagonizing the stupor of opium poisoning.

THERAPEUTICS.

The chief indications for the use of Opium are—(1) to relieve pain from any cause except acute inflammation of the brain; (2) to produce sleep, particularly in the insomnia of low fevers with delirium, in which the combination of Morphine and Chloral is very efficient; (3) to allay irritation in the various forms of acute nervous erethism; (4) to check excessive secretion, as in diarrheas, dysentery, diabetes, ptyalism, etc.; (5) to support the system in low fevers and other adynamic conditions, when sufficient food cannot be retained; (6) as a sudorific, to produce sweating in coryza, etc. It is considered of especial value in any irritation of the stomach, bladder or bronchi, in severe vomiting, both forms of diabetes, gastralgia, colic and muscular spasm. In diabetes mellitus Morphine by the mouth reduces the sugar promptly, but when used hypodermically it has little or no effect thereon, even in the same case. In peritonitis and inflammation of other serous membranes, used freely even to narcotism it has often saved life. In cerebro-spinal meningitis it is the one remedy if given early, before exudation has set in. Cholera morbus and dysentery are efficiently treated by Morphine and Atropine hypodermically (gr. $\frac{1}{8}$ with gr. $\frac{1}{200}$) after the ingesta have been removed by purging. In acute uremia its use in large doses is recommended by Loomis to control convulsions and promote diuresis, but here it is a dangerous agent. In muscular rheumatism and acute colds Dover's powder as a diaphoretic, conjoined with hot drinks and foot-baths, is old but excellent treatment. In chronic mania and melancholia, nervous prostration and the delirium of fevers, Opium is one of the best hypnotics. In acute mania it does not act so well as Hyoscine, and in delirium tremens [illegible] used only in cases which show great prostration, and then for temporary effects alone, as a stimulant. In chronic melancholia small doses of Opium three times a day give better results than any other treatment. Severe pain from any cause (except cerebritis) is relieved by Opium with an efficiency possessed by no other drug, as the pain of sciatica, neuralgia, lumbago, cancer, renal and hepatic colic from calculi, etc. Cough of harassing and frequent character with but little secretion is best treated by Opium, but when there is profuse expectoration it should not be used, as the lowering of excitability of the respiratory centre which it produces would be dangerous in such a case. In nearly all acute inflammations it is valuable, especially when it becomes advisable to lock up the bowels. Its tranquilizing power over the circulation makes it invaluable in the various forms of hemorrhage, while in that from uterine fibroids and cancer the implanting of the opium-habit is deserving of consideration as a beneficial measure, as it checks and even stops the bleeding, as soon as established. Dyspnea from any cause is relieved by Morphine, especially that of cardiac disease. "It gives the power to breathe" (Huchard). In cardiac disease, especially aortic stenosis or insufficiency, with dyspnea, paroxysms of angina pectoris, or signs of cerebral anemia,--Morphine hypodermically presents the greatest advantages.

Apomorphine, though a derivative of Morphine, is not narcotic in any degree. Administered by the mouth in small doses, gr. $\frac{1}{30}$—$\frac{1}{20}$, it is a valuable expectorant and given hypodermically in doses of gr. $\frac{1}{10}$ it is a powerful emetic. Its therapeutic value depends chiefly on these two properties and has many applications in practice. As an emetic it is of much service in poisoning, especially when swallowing is difficult, and it may be used with advantage in narcotic poisoning before narcosis has blunted the vagus centre. It is a very valuable agent in any case of poisoning where time is of great importance. As an expectorant it is one of the most efficient and useful agents at our command. In catarrh of the bronchi gr. $\frac{1}{30}$ by the mouth every three or four hours is very beneficial, but the drug must be used in all cases with caution, especially in young children, who bear it very badly. In hacking coughs without expectoration it will prove very serviceable, if given in very minute doses, not exceeding gr. $\frac{1}{16}$ in the entire 24 hours. In phthisis it may be given in combination with morphine with great advantage, especially in cases where there are dyspnea, continual and harassing cough, and thick, tenacious expectoration. The two agents do not destroy each other's action, but from the combination we get increased secretion from the mucous membrane, with diminished irritability of the respiratory centre and consequently lessened cough (Brunton). Apomorphine has been used successfully, by hypodermic injection, as an antidote to strychnine in dogs; and in one case, in which it was given in mistake for morphine, it entirely dissipated an acute and severe attack of sciatica. In small doses, gr. $\frac{1}{30}$ hypodermically, it has been used as a hypnotic, and is said to produce a sleep lasting from one to two hours (Douglas).

Codeine is much employed as a palliative for cough, especially the irritable, hacking cough of phthisis unaccompanied by much expectoration. It seems to have a special influence on the nerves of the larynx, and will relieve a tickling cough better than any other form of opium, if given in one dose of gr. ½ an hour before bed-time. In vomiting from almost any cause, doses of gr. ¼, repeated two or three times at hourly intervals, are usually very efficient. In the milder forms of diarrheа, gr. ½ to gr. j will generally check the disorder without inducing any unpleasant after-effects. In diabetes Codeine lessens the amount of sugar in the urine and often removes it entirely, but it must be given in large doses, beginning with gr. ij–iv, and rapidly increasing to gr. xv or xx. It is highly efficient in abdominal and pelvic pain, especially when ovarian in origin.

Applications of the Various Preparations.

Superficial pain is often alleviated by the plaster or by extemporaneous liniments containing laudanum or some other fluid preparation. It is, however, very doubtful whether such applications are of direct value, as morphine is not absorbed by the unbroken integument; but the oleate is said to be very penetrating. *Intense pain*, as from the passage of calculi, is best met by the hypodermic injection of morphine sulphate in full doses (gr. ¼–½) with atropine sulphate (gr. $\frac{1}{100}$). Either the solution of morphine or the liquid preparations of opium may be given by the mouth in corresponding doses for the same purpose. Severe pain enables the system to resist the action of opium, which in such cases should be repeated at short intervals for effect, regardless of dosage.

Sedative action is obtained by different preparations for various organs. The stomach is best affected by the solution of morphine in effervescing mixtures, the extract in a small pill, or morphine given hypodermically over the epigastrium. The intestines may be influenced by laudanum in an enema of starch, or internally by Dover's powder, pulvis opii, or pil. opii, especially the latter with or without calomel, as an astringent when the bowel must be quieted, as in peritonitis, hernia, intussusception, etc. The rectum and other pelvic organs are promptly affected by a suppository of the extract of opium, gr. ¼, with gr. $\frac{1}{12}$ of the extract of belladonna. The ovaries and the abdominal and pelvic organs generally are markedly susceptible to the analgesic action of codeine in doses of gr. j to gr. ij for an adult in severe pain.

To produce sleep the most efficient preparations are the tinctures, the solution of morphine, pil. opii and Dover's powder, in doses corresponding to the degree of insomnia and restlessness present.

Cough is relieved by the two trochisci, the tinctures, and by the solution of morphine in small doses with syrup of wild cherry or syrup of tolu; also by codeine in the last-named syrup. *Diaphoresis* is obtained by the use of Dover's powder in either of its forms.

Administration.

Probably no drug in the materia medica is so useful as Opium or has so wide a range of application. At the same time no other drug requires such careful handling, by reason of the many influences which modify its action and uses. As before pointed out, children are extremely susceptible to its narcotic action, and women are more easily affected by it than men. Many persons are found with idiosyncrasies in respect to opium, some being easily narcotized, others being remarkably insusceptible to its action, and many suffer from a decided shock after its hypodermic administration, which may even produce alarming symptoms of collapse. In subjects of kidney disease it may accumulate and act more powerfully than expected, and generally it may be said to be *contraindicated* or to be used with great care in alcoholism, congestion of the brain, and advanced disease of the respiratory organs, heart and kidneys.

The conjoint administration with opiates, of the spiritus ætheris, spiritus ætheris compositus, or spiritus ætheris nitrosi, an equal part with tinctura opii deodorati, will prevent the nausea often excited by the latter, and correct the drying-up effects of opium, due to its checking secretion. Some of its cerebral effects, as vertigo and mental confusion, are removed by a full dose of potassium bromide, others are antagonized by quinine, and the general intra-cranial effects of the drug are to some extent opposed by digitalis and tartar emetic.

Morphine and Atropine are sufficiently antagonistic to each other to make their combination extremely valuable as a therapeutic measure, and their use as mutual antidotes in poisoning by either a most efficient procedure if employed with due precautions. When morphine is given as a hypnotic or an anodyne, atropine should always be administered at the same time in the proportion of gr. $\frac{1}{120}$–$\frac{1}{100}$ of the latter to gr. ¼ of the former. By this means the anodyne and hypnotic qualities of morphine are increased, while the nausea and depression with the subsequent dyspepsia and constipation due to it are avoided. Moreover, as in the doses above mentioned atropine is a cardiac and respiratory stimulant, it will counteract the depressing tendency of morphine on the heart and respiration in subjects who have undue susceptibility to its action.

ORIGANUM, Wild Marjoram (Unofficial),—is the plant *Origanum vulgare*, a perennial herb of the nat. ord. Labiatæ, native of Europe and America. It contains a Volatile Oil, some tannin, resin, and a bitter principle. The oil was formerly much used and was official, but it is now superseded by the Oil of Thyme. Origanum is an ingredient of Vinum Aromaticum. Dose, ʒj–ij, in infusion.

Origanum is gently tonic, also carminative, stimulant, and emmenagogue. It was formerly much employed as a diaphoretic, etc., but is now rarely administered.

OXYGENIUM, Oxygen, O. This element is not official though it is extensively used in medicine. Its two combinations with Hydrogen, *Water* H_2O, and *Hydrogen Dioxide* H_2O_2, are official, as are also nine other *Oxides*, namely—those of Antimony, Barium, Ethyl, Iron, Lead, Manganese, Mercury, Silver and Zinc. It enters into the composition of most of the acids and their salts, many of the organic bases, and all the alkaloids except a few.

Oxygen is the most universally diffused element in nature, forming about one-fifth of the atmosphers, one-third of water, and a great part of the earth and of the tissues of plants and animals. It is a colorless, odorless, and tasteless gas, of sp. gr. 1.1057, and can be liquefied by subjection to extreme cold and pressure combined. It was discovered by Priestley in 1774, and given its name, *Oxygen* (acid producer) by Lavoisier in 1778. It may be obtained pure from many of its combinations, but is usually prepared by heating Manganese Dioxide or Potassium Chlorate, or preferably both together. It is furnished by manufacturing chemists in all large cities, compressed in iron cylinders furnished with a rubber bag and mouth-piece by which to administer it.

Ozone, O_3 (Unofficial),—is an allotropic form or condensed condition of Oxygen, three atoms of which are contained in a molecule of the former, instead of two as in the molecule of oxygen. Ozone exists in the atmosphere in the general proportion of 1 part in 10,000, but it is more abundant in the open country and on the ocean than in the air of cities. It is formed when an electric spark is passed through air, being then manifested by its peculiar odor. In the sick-room it may be produced by dissolving in water a mixture of Manganese Dioxide, Potassium Permanganate and Oxalic Acid.

Official Preparations.

Aqua Hydrogenii Dioxidi, *Solution of Hydrogen Dioxide, Solution of Hydrogen Peroxide*, commercially known as "Peroxide of Hydrogen,"—consists of water to which nascent Oxygen has been presented, whereby an additional atom thereof has entered into combination with the hydrogen, producing H_2O_2. It is officially described as a slightly acid, aqueous solution of Hydrogen Dioxide, containing when freshly prepared about 3 per cent. of the pure dioxide, corresponding to about 10 volumes of available oxygen; and is directed to be prepared by agitating Barium Dioxide in cold distilled water, adding Phosphoric and Dilute Sulphuric Acids, filtering and diluting to the required strength. The commercial article is said to contain about 15 volumes of available oxygen, and to be permanent at ordinary temperatures; but it undergoes decomposition in time, especially if agitated. It occurs as a colorless liquid, without odor, slightly acidulous, producing a peculiar sensation and soapy froth in the mouth, and liable to deteriorate by age, heat or protracted agitation. Dose, ʒj–iij, diluted with 3 to 4 parts of water.

Aqua, *Water*, H_2O,—is described under its own title.

Oxides of Antimony, Ethyl, Iron, Lead, Mercury, Silver and Zinc, and the **Dioxides** of Barium and Manganese, are described under the titles of their metallic bases.

Unofficial Preparations.

Glycozone is claimed to be a stable compound resulting from the reaction between chemically pure glycerin and 15 times its volume of ozone; and not a mixture of hydrogen dioxide with glycerin. It is very hydroscopic, and must be kept tightly corked, to prevent deterioration. It is said to act upon diseased tissue in the same manner as Hydrogen Dioxide (which see), but more slowly, and may be used in full strength as an application to wounds or suppurating surfaces, to stimulate healthy granulations, and generally as an antiseptic surgical dressing. It is mixed with water (1 to 10) as a rectal injection; and may be administered internally, in doses of ʒj–ij in a wineglassful of water, in gastric affections, as dyspepsia, pyrosis, ulcer and catarrh of the stomach.

Pyrozone is the name given by a well-known manufacturer to a concentrated solution of Hydrogen Dioxide in Ether. It is said to contain about 50 per cent. of the dioxide and is a very potent and efficient oxidizer, intended for external use only. It has abundant applications in the practice of surgeons. (Squibb.)

Sanitas is a proprietary solution for disinfecting purposes, containing Hydrogen Dioxide, and described under TEREBINTHINA.

PHYSIOLOGICAL ACTION.

Oxygen is essential to respiration, blood-formation, nutrition and tissue-change, in fact to life itself, and to fully describe its physiological action would involve a complete description of these processes, which would be a treatise on physiology. Applied to the unbroken skin it has no apparent effect, but when applied to a wounded tissue it increases the circulation therein and acts as a stimulant. Inhaled in the pure state (not as air) it causes very little constitutional disturbance. A slight sense of heat is felt in the mouth and may extend along the larynx, trachea and bronchi. The pulse is usually quickened, but it may be lessened in frequency, the appetite is increased, the temperature is slightly raised and the cardiac action is stimulated; a sense of mental exhilaration and a disposition to greater bodily activity are produced, but no constant influence on the excretions has been noticed. In some persons it seems to cause nervous symptoms similar to those produced by nitrous oxide gas (Brunton).

Ozone is a powerful oxidizing and destructive agent. It attacks metals, destroys organic substances and the coagulability of albumin and decomposes blood. It is highly irritant to the tissues, and sets up an acute catarrh of the respiratory mucous membrane if inhaled in quantity. When present in small quantity in the air it is breathed without unpleasant effects and is decidedly soporific (Binz). It is poisonous to low organisms, and is therefore an energetic antiseptic and disinfectant. In animals it sometimes quickens and often slows respiration, and produces excitement followed by exhaustion, sometimes by convulsions and death.

Hydrogen Dioxide, in fresh solution, is one of the most powerful oxidizing agents known, by reason of the facility with which it parts with oxygen to oxidizable substances brought in contact with it. It is consequently a powerful yet non-toxic antiseptic, destroying morbid products and organized ferments to which it is applied. In contact with a suppurating surface it generates a white foam, as the result of its action on the pus. This soon subsides, leaving the subjacent tissue cleansed of all morbid secretions. One part added to 1000 of water containing sewage or infectious microbes is sufficient to destroy the various organisms if allowed to act thereon for 24 hours.

THERAPEUTICS.

Oxygen is efficient as an application to the surface in atonic, scrofulous and syphilitic ulcers, also in cases of senile and other forms of gangrene. Its application to the scalp, by means of a rubber cap fitted to the head, has restored the hair in a case in which it was lost by reason of alopecia areata. Its principal use has been in cases of disease of the respiratory apparatus characterized by dyspnea, as emphysema, bronchial dilatation, phthisis and gangrene of the lungs, also spasmodic asthma, and asphyxia from the inhalation of toxic gases or due to opium and chloroform narcosis. It has been employed with benefit in uremic coma, and in the dyspnea of cardiac disease and that of anemia from loss of blood or from protracted suppuration. It has given good results in diseases characterized by defective oxidation, as gout and diabetes; in the latter affection the sugar sometimes disappears entirely from the urine during its inhalation. It has been used in the treatment of epilepsy and spasm, and is recommended in cholera.

Ozone has been recommended in cases similar to those for which oxygen is used; also in infectious diseases, as diphtheria, in which it is expected to destroy the pathogenic microbes exposed to its influence.

Hydrogen Dioxide in solution has long been employed as a bleaching agent for delicate fabrics, and on the human hair for the production of the "bleached blonde" hue so fashionable lately in certain circles of society. As a cleansing agent for foul wounds, ulcers, sores, and the like, it is highly efficient; and has been used with great benefit as a gargle or spray to the throat and nasal passages, in quinsy, croup, diphtheria, scarlet fever, ozena, and other morbid conditions of these parts. As a diagnostic agent in determining the presence of pus, it is injected into the part in which suppuration is suspected, and indicates its contact with pus by causing an almost immediate swelling up of the part. If such a spot is cut into at once, pain is not felt. In this manner a number of suppurating buboes have been treated with great success. As a disinfectant of drinking water suspected of pollution it is highly recommended, as it does not impair the taste or other potable qualities of the water in the small quantity (1 to 1000 parts) needed for its efficient action. Used internally it imparts oxygen to the blood, improves digestion, and relieves spasm of the respiratory apparatus,—aborting the paroxysms of whooping-cough. It gives great relief in chronic bronchitis with dyspnea, and operates well in phthisis by promoting digestion, palliating cough, and giving increased activity to chalybeate remedies.

PARALDEHYDUM, **Paraldehyde**, $C_6H_{12}O_3$, a polymeric modification of Ethylic Aldehyde C_2H_4O,—is a colorless liquid at ordinary temperatures and is obtained by treating Aldehyde with dilute sulphuric or nitric acid; aldehyde being the oxidation product of alcohol just preceding the formation of acetic acid. Paraldehyde is soluble in 8½ of water, and miscible, in all proportions, with alcohol, ether, and fixed or volatile oils.

The dose of Paraldehyde may be placed at ʒss–ʒijss, but the latter quantity has frequently been exceeded without any ill effects, with no digestive or cerebral disturbances following, nor any unpleasant symptoms resulting other than a disagreeable odor of the breath. Very few cases of poisoning therefrom, acute or chronic, are recorded. One case, under treatment by Dr. Mackenzie, of Douglas, in the Isle of Man, recovered from a dose of 3½ ounces after 34 hours of sleep, furnishing "a striking testimony to the safety of Paraldehyde as a hypnotic." The average hypnotic dose for an adult is about ʒjss, given in ℥j of simple elixir.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Paraldehyde is a reliable hypnotic, almost equal in this respect to Chloral, though its hypnotic action is not so persistent as that of the latter drug, and it requires more frequent repetition to produce sustained sleep. It is also antispasmodic and diuretic but not diaphoretic, and is unquestionably safer than chloral, strengthening and slowing the heart's action, instead of weakening it. Its administration is followed by a well-marked stage of excitement, after which it produces a sound sleep which is described as refreshing. It does not interfere with the appetite or digestion, but occasionally causes an erythematous eruption; and may give rise to cerebral congestion and vaso-motor paralysis if used for any long period of time. A toxic dose paralyzes the medulla and the respiratory centre therein.

Paraldehyde is used as a hypnotic in fevers, rheumatism, acute mania, hysteria and insomnia from various causes, also as an antispasmodic in asthma. Several cases of tetanus have been treated successfully with it, and it has been found useful as a diuretic and hypnotic in a case of senile arterial degeneration with double aortic and mitral regurgitant murmurs, mental depression and very marked insomnia and restlessness.

Cases of Paraldehyde habit are occasionally seen, and exhibit a train of symptoms similar to those observed in delirium tremens. There is great emaciation and anemia, weak and irregular action of the heart, a soft and intermittent pulse, general muscular weakness, tremulousness and restlessness, the gait feeble and unsteady, mental anxiety, agitation and confusion, temporary loss of memory and incoherent speech, also hallucinations of sight and hearing and delusions, all of an unpleasant kind. There is marked gastric derangement, but an abnormally large appetite, excessive flatulence and constipation. The treatment of such a case generally takes about three months, and should be conducted in an inebriate asylum.

PAREIRA, **Pareira**, *Pareira Brava*,—is the root of *Chondodendron tomentosum*, a climbing, woody vine of the nat. ord. Menispermaceæ, with very large leaves and a grape-like fruit, inhabiting Peru and Brazil. It contains *Pelosine* or *Cissampeline*, an alkaloid identical with the Berberine of *Nectandra* and the Buxine of *Buxus sempervirens* (Boxwood). Several other Pareiras are on the market, that from the West Indies (*Cissampelos Pareira*) being the plant formerly official in the Br. Phar.

Extractum Pareiræ Fluidum, *Fluid Extract of Pareira.*—Dose, ʒss–ʒj.
Infusum Pareiræ, *Infusion of Pareira* (Unofficial),—1 in 17. Dose, ℥j–ij.

Pareira is diuretic and laxative, stimulating peristalsis and the action of the kidneys. It is eliminated by the kidneys, and passing over the mucous membrane of the genito-urinary tract it acts thereon in a tonic and soothing manner, especially on the bladder. It is particularly useful in chronic cystitis, suppurative kidney diseases, gonorrhea and gleet, but must be used internally, as when injected locally for these affections it has not proved successful. Formerly Pareira was considered an efficient lithontriptic, and in Brazil it is used as a cure for the bites of poisonous serpents, being employed both internally and locally.

PASSIFLORA INCARNATA, Passion-flower (Unofficial),—is an indigenous plant which is highly esteemed by many American physicians as a calmative, analgesic and hypnotic remedy. It has been administered with satisfactory results in neuralgia, chorea, spasmodic asthma, pertussis, hysteria, dysmenorrhea, insomnia, infantile and puerperal convulsions and the opium-habit. A concentrated tincture is prepared from the whole plant, the dose of which is ʒss–j every 2 or 3 hours.

PEPO, Pumpkin-seed,—is the seed of *Cucurbita Pepo*, or common Pumpkin (nat. ord. Cucurbitaceæ). The active principle is a resin contained in the endopleuron or envelope immediately surrounding the embryo. It also contains an alkaloid *Cucurbitine*, a fixed oil, starch, sugar, etc. There are no official preparations. Dose, of the resin, gr. xv; of the seeds, ℥j–ij, beaten up into an emulsion with sugar and water.

Pumpkin-seed is an efficient agent for the removal of tapeworm, and its use is not followed by unpleasant symptoms. The outer coat of the seed should be removed, and an emulsion then made by trituration with sugar and water. This, if taken on an empty stomach and followed by a brisk cathartic, will generally prove effective. Dr. Squibb maintains that the seeds should not be decorticated, but that husks and all should be swallowed. According to some observers the expressed oil is equally efficient in doses of ℥ss repeated two or three times and followed by a cathartic.

PEPSINUM, Pepsin,—is the name for the hypothetical digestive principle of the gastric juice. As a definite body it is unknown, the various preparations, official and unofficial, being mere approximations and varying much from each other. It is officially described as a proteolytic ferment or enzyme, obtained from the glandular layer of fresh stomachs from healthy pigs, and capable of digesting not less than 3000 times its own weight of freshly coagulated and disintegrated egg albumin, when tested by the official process.

Pepsin is a fine, white, or yellowish-white, amorphous powder, or thin, pale-yellow, translucent grains or scales, free from any offensive odor; soluble in about 100 of water, more soluble in water acidulated with HCl, insoluble in alcohol, ether or chloroform. I usually has a slightly acid reaction, and may be neutral, but should never be alkaline. Commercial Pepsin is usually obtained from a solution prepared by digesting the mucous membrane scraped from the rennet-bags of sheep or the stomach of the pig in acidulated water for several days. It is then precipitated by sodium chloride (*Scheffer*), lead acetate (*Boudault*), or by drying the peptones on glass plates (*Beale*). It may also be precipitated by alcohol. By Scheffer's process it occurs as a tough, gray, leathery substance, partly soluble in water, one grain dissolving 3000 grains of albumin in a few days. Jensen's Crystal Pepsin, probably prepared after Beale's method, is in yellowish, translucent scales, soluble in water, and reputed to be many times stronger than any other preparation yet obtained.

Preparations.

Pepsinum Saccharatum, *Saccharated Pepsin,*—is Pepsin 1, triturated with 9 of Sugar of Milk. One part should digest at least 300 parts of egg-albumin, when tested by the official process. Dose, gr. v–ʒj, shortly after meals.

Liquor Pepsini, *Liquid Pepsin* (Unofficial), contains of Saccharated Pepsin 40 parts, Hydrochloric Acid 12, Glycerin 400, Water q. s. ad 1000 parts. Dose, ʒij–iv.

Every manufacturer of Pepsin has his own preparation and his peculiar name therefor, such as Liquid Pancreopepsine, Lacto-peptine, Gluco-pepsine, Golden Scale Pepsin, Peptogenic Milk Powder, etc. They vary considerably in their properties, but all have the power in some degree of digesting albumin and fibrin.

Lactopeptine (Unofficial),—is claimed to contain Pepsin, Diastase or Ptyalin, Pancreatin, Lactic and Hydrochloric Acids, and that ʒj will digest ℥viij–x or albumin, fibrin, casein, or gelatin, will emulsionize ℥xvj of cod-liver oil, and convert ℥iv of starch into glucose. A proprietary preparation. Dose, gr. v–xv.

Peptenzyme (Unofficial),—is prepared from the peptic, pancreatic, salivary, Lieberkühn's and Brunner's glands and the ferment extract of the spleen and liver, slightly benzoated and mixed with sugar of milk and citric acid. It is claimed for it that it contains the active ferments and undeveloped ("mother") enzymes of all the digestive organs or glands, in the same physiological condition as that in which they exist in nature; that it digests food in an acid, an alkaline or a neutral menstruum; and that it will digest all kinds of food. It is best administered before meals.

Analogous Products.

Pancreatinum, *Pancreatin,*—is officially described as a mixture of the enzymes naturally existing in the pancreas of warm-blooded animals, usually obtained from the fresh pancreas of the hog (*Sus scrofa*). It occurs as a yellowish-white or grayish, amorphous powder, of faint odor, and meat-like taste; slowly soluble in water, insoluble in alcohol. It consists of four ferments, viz.: (1) *Trypsin,* the proteolytic ferment, (2) *Pancreatic Diastase,* the amylolytic ferment, (3) a fat-emulsifying, and (4) a milk-curdling ferment. Besides the official form it is sold in various preparations, as Pancreatic Emulsion and the following—

Liquor Pancreaticus, *Pancreatic Solution* (Unofficial),—prepared by digesting a finely-chopped pig's pancreas with 4 times its weight of dilute alcohol. It is a nearly clear alcoholic solution, with little taste or smell. Dose, ʒj–℥ss.

Ingluvinum, *Ingluvin* (Unofficial),—is obtained from the gizzard of the domestic fowl, and owes its activity to a peculiar bitter principle, and not to any ferment corresponding with pepsin. Dose, gr. x–xxx.

Unofficial Vegetable Digestives.

Papain, *Papaiva, Papayotin,*—is a vegetable ferment obtained from the milky juice of *Carica Papaya*, a S. American fruit-tree of the nat. ord. Papayaceæ. It is soluble in water but not in alcohol, and has active digestive powers. It is composed essentially of a mixture of vegetable globulin, albumoses and peptone, with which are associated the ferments characteristic of the preparation. It is marketed under the name *Papoid.* Dose, gr. j–iij. *Papaw Milk* is the milky juice of the fruit, coagulating into two parts, a pulpy mass and a liquid serum. When mixed with alcohol an amorphous powder is precipitated, which when dried forms Papain.

Bromelin,—is an active digestive ferment contained in the fresh juice of *Ananassa Sativa*, the Pineapple. It is more nearly related to trypsin than to pepsin, and is decidedly active in the presence of either acids or alkaline carbonates, but is most energetic in neutral solutions, and is a very constant and powerful digestant of vegetable and animal proteids. Dose of the fresh pineapple juice, ℥ ss–j.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Pepsin is not a solvent but a ferment, and is a normal constituent of the gastric juice, converting albuminoids (casein, albumin, fibrin, etc.) into peptones for assimilation, with the aid of the lactic and hydrochloric acids associated with it. This it will do out of the body or in cavities as the rectum, if warmth, acidity and moisture are present. Pancreatin, on the other hand, is destroyed by acids and requires an alkaline medium in which to exercise its powers. As the food passes out of the stomach in 2 or 3 hours, Pepsin should be administered within and Pancreatin after that period, to be effective. Alcohol destroys the activity of pepsin, alkalies and many mineral salts precipitate it.

Dyspepsia in its various forms is the malady for which Pepsin is chiefly employed, but it is also extremely useful in the apepsia of infants, gastralgia, anemia, chlorosis, gastric ulcer and cancer, the diarrhea of infants and the vomiting of pregnancy. It is added to nutritive enemata, the rectum not being a digestive organ, and is injected into the substance of morbid growths which are homologous to the tissues, particularly fatty tumors, for the purpose of arresting their growth and promoting their absorption. It has been injected into the bladder to break down a blood-clot, and has been suggested as an atomized inhalation in diphtheria and croup to digest the membrane without injuring the living tissues.

Pancreatin digests albuminoids and converts starch into sugar and proteids into peptones, also emulsifies fats in the presence of an alkaline solution (Pepsin requiring an acid one). Prolonged contact with mineral acids renders it inert. It is digested by pepsin, and hence probably never passes into the duodenum in its own character. Pancreatin is used to partially digest (peptonize) milk, gruel, soups, and other foods, before their administration in cases of great digestive debility. These peptonized foods may be administered by the stomach or the rectum, and are valuable in intestinal dyspepsia, wasting diseases, and convalescence from acute affections. A teaspoonful of Pancreatin solution taken after the administration of cod-liver oil will prevent the disagreeable eructations which are so offensive to some patients, and will aid in the digestion of the oil.

s greatly from the other digestive ferments. It acts more rapidly than pepsin and
er temperatures. It is a rapid solvent of false membranes and intestinal worms;
s been injected into neoplasmic tumors, dissolving their tissues in its immediate
, but with much pain and considerable febrile reaction. Papoid has been used as
locally in diphtheria, to destroy and remove the false membrane; internally, in
and gastro-intestinal catarrh, the diarrhea of infancy and various dyspeptic con-
, with very great success. Its power over both gastric and intestinal indigestion
s it much more useful than either pepsin or pancreatin in cases of doubtful diag-
in which it is difficult to decide as to the location of the trouble.
oid may be obtained in powder or tablets, either alone or in combination with
bicarbonate, boracic acid, and nux vomica; also as a glycerole which is said to be
anent liquid preparation. The dose of papoid is from 1 to 3 grains, but 5 grains
e may be given in special cases.

eapple Juice is one of the most efficient digestive aids at our command, and has
vantage of being pleasant to the patient. The author directs the fruit to be cut
ces as required, and the juice to be squeezed out immediately before administra-
It has long been used by the natives of South Africa as a remedy for diphtheria
phtheritic sore throats with unusual success, according to the testimony of com-
observers; and has been employed by Dr. Chambers of Calcutta in this disease
arked benefit. He had the patient sip the juice all day at short intervals, or else
ate slices of the fruit and swallow the juice; but as he employed *Papaya* fruit in
ne cases it is impossible to give all the credit of his success to the pine-apple.

TROLATUM,—is a mixture of hydrocarbons, chiefly of the
-gas series, obtained from Petroleum, by distilling off the lighter
ns and purifying the residue. It is colorless or yellowish, and in
tter case is more or less fluorescent; amorphous, odorless and taste-
of neutral reaction, insoluble in water or alcohol, soluble in ether,
oform, benzin, fixed and volatile oils, etc. Commercially it is
n as *Cosmoline*, *Vaselin*, *Petroleum Ointment*, etc., and is largely
red from residuums or sediments deposited in tanks containing
petroleum. It is official in the following three forms, all of which,
heated, give off a faint odor of petroleum, viz.:—

rolatum Liquidum, *Liquid Petrolatum*,—an oily, transparent fluid, of sp. gr.
o 0.945.

and fixed oils. Uncombined, it forms an excellent bland application in all irritated conditions and injuries of the skin.

Albolene and **Glymol** are two of the numerous proprietary products of petroleum. They are odorless, do not become rancid, and are employed as bases for ointments and as lubricants. Liquid Albolene is readily diffused in the form of a spray and is a good solvent for drugs intended for application to the naso-pharyngeal mucous membrane.

PHENACETINUM, Phenacetin, *Oxy-ethyl-acetanilid, Para-acet phenetidin,* $C_{10}H_{13}NO_2$, (Unofficial),—is a crystalline substance, closely allied in composition to Acetanilid, and produced by the action of glacial acetic acid on para-phenetidin, a body obtained from phenol.

Phenacetin occurs in colorless, tasteless, inodorous, scaly crystals, sparingly soluble in cold water, more freely in boiling water, also in about 16 of alcohol. Dose, gr. ij–xx;—as an antipyretic, gr. viij–x hourly or every two hours, in powder or tablets; against neuralgia and rheumatism, gr. xv, repeated if necessary up to ℥jss in 24 hours.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

The physiological action of Phenacetin is similar to that of Acetanilid. It is probably the safest of the new synthetical antipyretics, yet in sufficiently large doses it is as poisonous as any of its analogues. Cerna reports a case in which a baby, five days old, received seven 2-grain doses of phenacetin in three days, by mistake for bismuth, and was deeply cyanosed for three days and less so for nearly a month, notwithstanding the repeated employment of oxygen inhalations. There was also marked jaundice, with grave anemia, and pronounced loss of weight.

Phenacetin reduces pyrexia gradually and causes perspiration without producing collapse. It is also analgesic and hypnotic in action, relieving pain and inducing sleep. It has been administered with benefit, in 2-grain doses with ½ grain of citrated caffeine at short intervals, for migraine; also in epidemic influenza, both as a prophylactic and as a remedy. As an antipyretic it is extensively employed in phthisis, peritonitis, polyarthritis, endocarditis, typhus and typhoid fevers; and as an analgesic in vaso-motor neuroses, for the lancinating pains of locomotor ataxia, also in neuralgia and hemicrania. It is highly praised in whooping-cough, rheumatic and other fevers, and though slower in action than Antipyrin or Acetanilid it is deemed fully as efficient in reducing pyrexia, while usually free from the depressant after-effects of the latter agents.

Lactophenin, *Lactyl-para-phenetidin* (Unofficial),—is another phenetidin derivative, containing a lactic acid constituent instead of the acetic acid one of phenacetin. Its action is antipyretic, analgesic and hypnotic, and it has been recommended as a substitute for phenacetin on account of its greater solubility. It has been used with special benefit in abdominal typhus (Jaksch); also in acute rheumatism, chorea and locomotor ataxia (Von Roth). Dose, gr. viij–xv or more, up to ℥jss daily, in wafers.

Methacetin, *Oxy-methyl-acetanilid* (Unofficial),—derives its name from its analogy to Phenacetin, from which it differs only in containing a methyl group in place of an ethyl one. From Acetanilid it differs in the substitution of the oxy-methyl group for a hydrogen atom. It occurs as lustrous, scaly, colorless, odorless crystals; soluble in 12 of hot water, in alcohol, chloroform, glycerin and fatty oils; scarcely soluble in cold water. Methacetin was introduced as an antipyretic for children and feeble persons, and promised at one time to supersede phenacetin. It is well borne, and no malaise, tinnitus, cardiac weakness or exanthem follow its ingestion; but it often gives rise to a violent and exhausting perspiration. It has been used successfully in typhoid fever, all forms of rheumatism, neuralgias, pneumonia and in most forms of pyrexia, but has not as yet equaled the results obtained by either phenacetin or antipyrin. Its employment in phthisis was not favorable, chiefly by reason of the profuse sweating induced by it. Its advantages, over all the other antipyretics of its class, are its lack of toxic properties and its comparatively ready solubility in water, being five times more soluble than its rival, phenacetin. Dose, gr. iij–v, or more.

Malakin, *Salicyl-para-phenetidin*,—is described under SALICINUM.

Phenocoll Hydrochloride (Unofficial),—is another synthetical antipyretic, closely allied to Phenacetin, both chemically and medicinally, and distinguished by its comparatively free solubility. It is produced by the interaction of Phenetidin and Glycocoll (amido-acetic acid), and occurs as a white, micro-crystalline powder, soluble in about 16 of water, therein forming a neutral solution. The pure base, Phenocoll, is precipitated from the solution by ammonia, the fixed alkalies and their carbonates.

Phenocoll Hydrochloride may be looked upon as a soluble Phenacetin, 15 grains dissolving readily in ℥j of water. With decided antipyretic, antirheumatic and analgesic powers, it possesses a marked advantage over the other members of its class in that it has no injurious effect upon the blood corpuscles, even when in direct contact with them. It is promptly absorbed, readily excreted, and reduces the hyperpyrexia of fever without producing very profuse sweating or other unpleasant by-effects. The fall in temperature is very decided and occurs within an hour after the administration of the drug, being due to great diminution of heat-production, without any alteration of heat-dissipation. In ordinary doses it has no effect on the circulation, but large doses diminish the blood-pressure and reduce the pulse-rate, by stimulating the cardio-inhibitory centres. This drug has been employed with marked success as an antipyretic in hectic, malarial, typhoid and other fevers; also in acute rheumatism, neuralgia, epidemic influenza, and for the neuralgic pains of the latter affection. In combination with Piperazin, 15 grains of each daily, in a pint or more of carbonated water, it has rendered excellent service in gouty and rheumatic affections, especially when accompanied with pain and fever. The same combination has proven of service in a case of obstinate gastric irritability with uncontrollable vomiting, which had resisted every known remedy. The dose is gr. v–xxx, an average dose being about 12 grains, three or four times a day.

PHOSPHORUS, PHOSPHITES and PHOSPHATES,—

are best studied together, as the supplying of the element Phosphorus to the body is the aim of the administration of these agents.

Phosphorus, P,—is a non-metallic element obtained from bones, and occurs as a translucent, nearly colorless solid, of waxy lustre, and usually the consistence of beeswax, insoluble in water, to which, however, it imparts its characteristic odor and taste. It is soluble in 50 parts of any fatty oil, in 80 of absolute ether, 350 of absolute alcohol, and freely in chloroform and in carbon disulphide. It has a disagreeable odor and taste, melts at 111° F., and in the air it emits white fumes which are luminous in the dark. On longer exposure to the air it ignites, and should be kept under water in a cool place, protected from light. It usually contains Arsenic and sometimes Sulphur, the limits of which are fixed by the official pharmacopœial tests. Dose, gr. $\frac{1}{100}$–$\frac{1}{10}$, thrice daily.

Preparations of Phosphorus.

Pilulæ Phosphori, *Pills of Phosphorus*,—each contains gr. $\frac{1}{100}$ of Phosphorus, dissolved in Chloroform, mixed with Althæa and Acacia in Glycerin and Water, and coated by shaking with a solution of Balsam of Tolu in Ether. Dose, j–v.

Oleum Phosphoratum, *Phosphorated Oil*,—has of Phosphorus 1 part, Ether and Expressed Oil of Almond to 100. Dose, ♏j–v thrice daily.

Acidum Phosphoricum, *Phosphoric Acid*, and **Acidum Phosphoricum Dilutum**, are described on page 104.

Acidum Hypophosphorosum Dilutum, *Diluted Hypophosphorous Acid*,—a liquid composed of about 10 per cent. of the absolute acid (HPH_2O_2), and about 90 per cent. of water. Used in the preparation of Syrupus Hypophosphitum.

Spiritus Phosphori, *Spirit of Phosphorus*, *Tincture of Phosphorus*,—has of Phosphorus 1.2, dissolved in Absolute Alcohol 1000.

Elixir Phosphori, *Elixir of Phosphorus*,—has of the preceding 210, Oil of Anise 2, [illegible], Glycerin 550, Aromatic Elixir to 1000. Each cubic cm. represents about ¼ milligramme [illegible] of Phosphorus (each ʒ contains about gr. $\frac{1}{64}$). Dose, ʒss–℥ss.

Tinctura Phosphori (*Thompson's*), Unofficial,—Phosphorus gr. j, Absolute Alcohol ʒv, Glycerin ℥jss, Alcohol ʒij, Spt. Menthæ Piperitæ ♏xl. Of this ʒj contains gr. ⅓ of Phosphorus. Dose, ʒss–ʒjss.

Tinctura Phosphori (*Bellevue Hospital*), Unofficial,—Phosphorus gr. xxxij, Absolute Alcohol, ℥xlvj, Essence of Vanilla ℥j, Oil of Orange ʒiij, Alcohol q.s. ad ℥xlviij. Of this ʒj contains gr. $\frac{1}{12}$ of Phosphorus. Dose, ʒss–j.

Zinci Phosphidum, *Zinc Phosphide*, Zn_3P_2,—crystalline fragments or a gray-black powder, insoluble in water or alcohol, but completely soluble in hydrochloric or sulphuric acids with evolution of hydrogen phosphide. Is very irritant. Dose, gr. $\frac{1}{50}$–$\frac{1}{20}$.

Preparations of Phosphites.

Calcii Hypophosphis, *Calcium Hypophosphite*, Ca $(PH_2O_2)_2$,—colorless prisms, or thin, pearly scales, of nauseous taste, soluble in 6.8 of water, insoluble in alcohol. Is an ingredient of the Syrupus Hypophosphitum. Dose, gr. x–xxx.

Ferri Hypophosphis, *Ferric Hypophosphite*, $Fe_2(H_2PO_2)_6$,—a white or grayish-white powder, odorless and tasteless, slightly soluble in water, freely so in hydrochloric acid or a solution of sodium nitrate. Dose, gr. v–x. A ferruginous tonic.

Potassii Hypophosphis, *Potassium Hypophosphite*, KH_2PO_2,—white masses, or a white, granular powder, deliquescent, odorless, of saline taste and neutral reaction. Soluble in 0.6 of water and in 7.3 of alcohol at 59° F. Dose, gr. v–x.

Sodii Hypophosphis, *Sodium Hypophosphite*,—$NaPH_2O_2 + H_2O$,—small plates, or a white, granular powder, deliquescent, odorless, of sweetish, saline taste, and neutral reaction. Soluble in 1 of water and in 30 of alcohol at 59° F. Dose, gr. v–x.

Syrupus Hypophosphitum, *Syrup of Hypophosphites*,—has of Calcium Hypophosphite 4½, of Potassium and Sodium Hypophosphites 1½ each, per cent. Dose, ʒj–℥ss.

Syrupus Hypophosphitum cum Ferro, *Syrup of Hypophosphites with Iron*,—has of Ferrous Lactate 1, Potassium Citrate 1, in Syrup of Hypophosphites to 100 parts. Dose, ʒj–℥ss.

Preparations of Phosphates.

Calcii Phosphas Præcipitatus, *Precipitated Calcium Phosphate*, $Ca_3(PO_4)_2$,—a light, white, amorphous powder, insoluble in water or in alcohol. Dose, gr. ij–x.

Syrupus Calcii Lactophosphatis, *Syrup of Calcium Lactophosphate*,—has of the preceding 2½ per cent. The Calcium Phosphate is dissolved by Lactic and Phosphoric Acids, but does not form the chemical combination suggested by the title. Dose, ʒj–℥ss.

Sodii Phosphas, *Sodium Phosphate*, $Na_2HPO_4 + 12H_2O$,—large, colorless, monoclinic prisms, efflorescent, of saline taste and alkaline reaction; soluble in 6 of water, in 1½ of boiling water, insoluble in alcohol. Dose, ʒj–℥j.

ood, (Unofficial),—has in each ℥, of Ferric Phosphate gr. 2½, Calcium
gr. j. Dose, ʒj–iij.

ol (Unofficial),—is a proprietary preparation, advertised to contain in each f℥
grains of Sodium Phosphate with Citric Acid and Sodium Nitrate. Dose,
n water.

hosphas Solubilis, *Soluble Ferric Phosphate*, and **Ferri Pyrophosphas**
—are described under FERRUM, *ante*, page 317.

PHYSIOLOGICAL ACTION.

orus in small doses stimulates the brain and circulation, the
of the stomach and the genital organs, and the growth of bones.
gestion by irritating the end-organs of the gastric nerves, but
eructations of hydrogen phosphide. Its fumes cause necrosis
per or lower maxillæ especially in those whose teeth are decayed,
may be prevented by the inhalation of the fumes from old acid
e. In poisonous doses it is a powerful irritant of the gastro-
tract, causing vomiting and purging with great depression of
forces. Reaching the blood as Phosphorus, it is partly oxidized
pense of the oxygen of the red corpuscles, causes acute hemor-
producing fatty degeneration of the arterial walls; also rapid
of the stomach, liver and heart, accompanied by deep jaundice;
irium, convulsions, coma and death, the latter usually from
ailure of the respiration and circulation. Acute yellow atrophy
er resembles phosphorus poisoning so much that it is generally
le to distinguish between them. The effect of Phosphorus on
sm is to increase the nitrogenous products, to diminish the ex-
f carbonic acid, to reduce the glycogen of the liver to almost
and to raise the temperature. While generally increasing meta-
so influences that process as to arrest it at the stage of the con-
f proteids into urea and oil, instead of allowing it to proceed
al oxidation of oil into carbonic acid and water, and hence it
atty degeneration of epithelial, glandular and muscular proto-

Sodium Phosphate acts on the blood and on the excretion of urea similarly to the calcium salt. It increases secretion generally, especially that of the bile, being an excellent cholagogue and thereby aiding in the digestion of fats. In half-ounce doses it is laxative. It is a normal constituent of the blood, and possesses the property of increasing the capacity of any fluid to hold carbonic acid in solution.

The Hypophosphites are generally tonic in action, and are supposed to constitute a safer form in which to administer Phosphorus than in the unoxidized state. They are probably converted into phosphates in the stomach.

Antidotes and Antagonists to Phosphorus.

Antidotes are *Hydrated Magnesia*, Lime-water, powdered Charcoal, Copper Sulphate and old acid Turpentine. Hydrated Magnesia as a quickly acting purgative, Lime-water or Charcoal to prevent the action of the poison on the tissues. *Potassium Permanganate* may have antidotal action. No Oils or Fats should be used, as they dissolve phosphorus and promote its absorption. *Opium* to antagonize the depression of the heart and system. *Transfusion* has proved efficient when the blood is seriously affected as a result of phosphorus poisoning. *Copper Sulphate*, as an emetic and to form the comparatively insoluble phosphide of copper, also *Crude French Acid Turpentine*, given rapidly in an emulsion of gum, are generally placed among the antidotes, but are both practically useless. The first has caused death more rapidly than the phosphorus, and the second is generally unobtainable, and has proved useless when employed.

THERAPEUTICS.

Phosphorus is chiefly used to promote the nutrition of osseous and nervous tissue. It is useful in chronic nervous exhaustion when the nerve centres are implicated, also in osteomalacia, rachitis and progressive locomotor ataxia. In threatened cerebral softening it affects the nerve centres as no other drug does, and in paraplegia of myelitic origin from excessive venery it is often very efficient. Progressive pernicious anemia has sometimes been arrested by Phosphorus in very small doses, while in impotence of functional character there is no remedy so effective. In wakefulness of the aged and that due to cerebral anemia small doses of the pill or tincture are sometimes remarkably beneficial. In certain skin diseases (acne, psoriasis, lupus), it is an excellent substitute for arsenic. Neuralgia is often cured by Phosphorus, but large doses are necessary at least gr. $\frac{1}{12}$ every four hours. A solution in Retinol is very stable, and is strongly recommended for the external and internal use of the drug.

Calcium Phosphate and the Hypophosphites are used with benefit in all diseases of mal-nutrition, and where the repair or development of the bones is required. They are particularly useful in protracted suppuration, osteomalacia, rachitis, caries, scrofulosis, chronic phthisis, and in the anemia and bone-softening of lactation. The Hypophosphites are much employed in nervous and general debility and in chronic lung diseases, and are supposed to act in the same manner as free phosphorus, but without irritation. They are probably converted into phosphates in the stomach, and hence may be expected to promote the growth and healing of bones, to stimulate the hepatic and intestinal secretions, and to affect the lymphatic glands and adenoid tissue. The Compound Syrup of the Hypophosphites is an excellent remedy in acne indurata.

Sodium Phosphate in doses of ʒj–ij thrice daily for adults (gr. x–xxx for children) is extremely useful as a laxative in conditions depending on catarrh of the bile-ducts and duodenum, as headache, jaundice, chalky stools, etc. Gall-stones may be prevented from forming by scruple or drachm doses before meals for months at a time. It is also an efficient agent in obesity, hepatic diabetes, incipient hepatic sclerosis, chronic infantile diarrhea, cerebral debility, bilious sick-headache, and the pasty, white stools of ill-conditioned children. Vichy-water contains this salt in the proportion of gr. ¾ to the pint, and is considered a valuable water in hepatic colic and kindred conditions. Hypodermic injections of Sodium Phosphate have been used with highly beneficial results in syringomyelitis and in unilateral astasia-abasia. Drs. Crocq and Luton of Rheims advocate the hypodermic use of this salt as a substitute for the organic extracts, and maintain that it is equally efficient in all cases in which these extracts have proved to be of value. [Compare the article on ANIMAL EXTRACTS, page 157.]

Crocq's solution contains Sodium Phosphate 1 part, Alcohol 5, Glycerin 20, Distilled Water 25; the dose of which is 3 cc. (about 45 minims) hypodermically, with aseptic precautions, once daily or on alternate days. Luton uses a solution of the crystallized Sodium Phosphate and Sodium Sulphate.

Glycero-phosphates (Unofficial),—have been used during the last few years, especially in France. Glycero-phosphoric Acid is prepared by mixing Phosphoric Acid 1 part, with Glycerin 1½, and gradually heating to 374° F. When pure, it is a yellow, odorless liquid, of syrupy consistence and acid taste, soluble in water and in alcohol. Dose, ♏j–v, three times daily. The salts in general use are—the Glycero-phosphate of Calcium, dose, gr. ij–v; of Iron, dose, gr. j–ij; of Lithium, dose, gr. iij–xv; and of Sodium (in 50 per cent. solution), dose, gr. ij–iv in sodium chloride solution by hypodermic injection.

This acid and its salts are said to accelerate metabolism and the nitrogenous exchanges, to promote the assimilation of albuminoids, and to increase the excretion of nitrogen, the oxidation of broken-up sulphur compounds and the elimination of sodium chloride. They may also favor the assimilation of the phosphates of the food and so protect the combined phosphorus of the nervous system from waste (Robin). The acid is highly valued as a nervine remedy and has been used with benefit in neurasthenia, locomotor ataxia, phosphaturia, lithemia and muscular atrophy. The Iron salt is praised in anemia and chlorosis.

PHYSOSTIGMA, Calabar Bean,—is the seed of *Physostigma venenosum*, nat. ord. Leguminosæ, a woody creeper of Calabar, West Africa, where it is used by the natives as an ordeal for witches, etc., vomiting after its ingestion being held to establish the innocence of the accused. It contains two alkaloids, *Physostigmine* (*Eserine*), $C_{15}H_{21}$-

N_3O_2, and *Calabarine*, which is antagonistic to the former and is allied to strychnine in its action, while Physostigmine resembles gelsemium.

Preparations.

Extractum Physostigmatis, *Extract of Physostigma*,—an alcoholic extract, of which the usual dose is from gr. $\frac{1}{16}$ to $\frac{1}{4}$, but gr. j–iv are used in tetanus.

Tinctura Physostigmatis, *Tincture of Physostigma*,—15 per cent. Dose, ♏v–xx.

Physostigminæ Salicylas, *Physostigmine Salicylate*, *Eserine Salicylate*,—colorless, columnar crystals, of bitter taste and neutral reaction, soluble in 150 of water and in 12 of alcohol. Dose, gr. $\frac{1}{100}$–$\frac{1}{60}$.

Physostigminæ Sulphas, *Physostigmine Sulphate*, *Eserine Sulphate*,—a white, micro-crystalline powder, of bitter taste, very deliquescent in moist air, very soluble in water and in alcohol. Dose, gr. $\frac{1}{100}$–$\frac{1}{50}$.

PHYSIOLOGICAL ACTION.

Physostigma is a direct spinal paralyzer, producing complete general paralysis and abolished reflexes, but not affecting muscular irritability or the cerebral functions. It stimulates secretion, excites nausea and vomiting, salivation and diaphoresis, and is laxative by stimulating the muscular coat of the intestines to increased peristalsis as well as by increasing the intestinal secretions. It first lowers then raises arterial tension, increases the frequency of the heart-beat, but depresses the power of the cardiac muscle though not destroying it. It produces dyspnea by a tetanic action on the respiratory muscles, causing carbonic acid narcosis and death by paralysis of respiration. It contracts the pupil (how, is disputed), also the ciliary muscle, producing marked myosis. It is eliminated chiefly by the kidneys, the urine of the animal affected poisoning another.

The alkaloids of Physostigma have opposite actions, and different or even contradictory results may be obtained from the drug according to the proportion of each in the preparation employed. Physostigmine represents the action of the bean, paralyzing the nervous centres and stimulating muscular fibre, while Calabarine causes convulsions like strychnine (Brunton). Physostigmine, in its action on the cord is allied to gelsemium and antagonistic to strychnine and to picrotoxin, but Calabarine is allied to both (Murrell).

Antagonists and Incompatibles.

Atropine is antagonistic as to the effects on the respiration, heart and pupils. *Chlor*[illegible] is also antagonistic, and over a greater field of action, but to be effective must be administered before the ingestion of the Physostigma. Tannic Acid, the vegetable astringents and the caustic alkalies are chemically incompatible.

THERAPEUTICS.

The applications of Physostigma are not many. It is efficient in constipation due to torpor of the bowels, in which condition it is usually combined with belladonna and nux vomica. In tetanus it has been used with advantage to diminish reflex excitability, but large doses (2 to 4 grains) must be given, and its effects must be carefully watched. In small doses it is a useful remedy in many nervous affections, such as locomotor ataxia, writers' cramp and the paraplegia due to myelitis, also in progressive paralysis of the insane which is apparently retarded by it. The extract should be given in these diseases, in doses of gr. $\frac{1}{10}$ in pill every three hours; and if the treatment is kept up for six months or longer the results will prove very satisfactory, though the improvement will be slow (Murrell). While theoretically antagonistic in poisoning by atropine or strychnine, practically it is not of much value therein.

Physostigmine (Eserine) is used locally by ophthalmologists for many purposes in affections of the eye. In a solution of gr. ij to the ℥ of water dropped into the eye it is efficient in breaking up or preventing adhesions of the iris, diminishes intraocular tension, prevents suppuration after operations, contracts the pupil, diminishing the entrance of light in photophobia, etc., and empties the vessels of the eye. It is very useful in keratitis, glaucoma, strumous ophthalmia, and neuralgia of the eyeball. The salts of Physostigmine in neutral solution may be used for these purposes, as well as to counteract the effects of atropine on the pupil. Gelatin disks medicated therewith may be obtained in the shops, and are a convenient form in which to use the drug for ophthalmic purposes. In dose of gr. $\frac{1}{100}$ hypodermically it has proved remarkably efficient as an occasional substitute for morphine, after the final withdrawal of that drug in the treatment of its habitués.

PHYTOLACCA, Poke,—is official under two forms, the fruit and the root of *Phytolacca decandra*, a plant of the nat. ord. Phytolaccaceæ, found in all parts of the United States. It contains a neutral principle *Phytolaccin*, and an acid *Phytolaccic Acid*, also tannin, starch, fixed oil, etc. The official titles are—

Phytolaccæ Fructus, *Phytolacca Fruit, Poke Berry,*— a depressed-globular, dark purple, compound berry, about ⅓ inch in diameter, inodorous, taste sweet, slightly acrid. Dose, gr. x–xxx.

Phytolaccæ Radix, *Phytolacca Root, Poke Root,*—large, conical, branched, fracture fibrous, inodorous, sweetish and acrid. Dose, as an emetic, gr. x–xxx; as an alterative, gr. j–v.

Preparations.

Extractum Phytolaccæ Radicis Fluidum, *Fluid Extract of Phytolacca Root.*—Dose, ♏j–xxx.

Tinctura Phytolaccæ, *Tincture of Phytolacca* (Unofficial).—Dose, ♏x–ʒj.

Physiological Action and Therapeutics.

Phytolacca is an emeto-cathartic, acting slowly but persistently, with great nausea and considerable depression. It lowers the rate of respiration and of cardiac action, and is a motor depressant, paralyzing the spinal cord and the medulla, death occurring from paralysis of respiration preceded by tetanic convulsions. Several cases of poisoning by this plant have occurred. Its action is antagonized by Alcohol, Ether, Opium, Digitalis, and other motor-excitants.

Alterative powers have been ascribed to Phytolacca, and competent observers have reported curative results from its use in malignant tumors, varicose and other ulcers, obstinate eczema, sycosis, favus and other skin affections, employing it both internally and externally. It is a very serviceable remedy in chronic rheumatism, and given internally has undoubtedly cured cases of granular conjunctivitis. Mastitis is sometimes aborted and suppuration of the breasts prevented by the use of the fluid extract internally while a solid extract is locally applied to the seat of the impending inflammation. In tonsillitis and diphtheritic sore throat, also in chronic follicular pharyngitis, it has been much used with good results, especially when there is high fever and pains in the head, back and limbs. In true adynamic diphtheria it will do little good.

Phytolacca has long been known to promote the absorption of adipose tissue, and was suggested as a remedy for obesity as early as 1858. A resinoid preparation of the berries is on the market as an "anti-fat" remedy, under the name *Phytoline*, the dose of which is ♏x six times a day, before and after each meal.

PICHI, Pichi (Unofficial),—is the shrub *Fabiana imbricata*, a member of the nat. ord. Solanaceæ, and a native of S. America. Among the Chilians it has been much prized as a remedy in cystitis with calculi and gravel, and in chronic catarrh of the bladder. It seems to have considerable power over the hematuria and pain of renal calculus. It is also highly praised in dyspeptic disorders. Its medicinal virtues reside in oleoresinous constituents which are insoluble in water. An extract is prepared from the leaves, of which the dose is gr. v–x in capsules. Dose of the fluid extract, ʒj, but it should not be added to water.

PICROTOXINUM, Picrotoxin, *Picrotoxic Acid*, $C_{30}H_{34}O_{13}$,—is a poisonous, neutral principle obtained from the seeds contained in the berries (*Cocculus Indicus*, Fish-berries), of *Anamirta paniculata* (Anamirta Cocculus, Menispermum Cocculus), a climbing shrub of the nat. ord. Menispermaceæ, a native of the East Indies. The berries contain, besides Picrotoxin, a large quantity of fixed oil and other substances of less interest. In the shell are found *Menispermin* an alkaline principle *Paramenispermin* which is neutral and crystalline, and *Hypopicrotoxi* *Acid*. There are no official preparations.

Picrotoxin occurs in colorless, flexible crystals, of bitter taste and neutral reaction, soluble in 240 of water and in 9 of alcohol, also in acids and in alkaline solutions. Dose by the stomach gr. $\frac{1}{60}$–$\frac{1}{20}$, cautiously. For hypodermic use a solution in water of gr. ij in ℥j may be used, in doses of gr. $\frac{1}{60}$–$\frac{1}{40}$ of the principle, ♏iv equalling gr. $\frac{1}{60}$.

Unofficial Preparations of Cocculus.

Tinctura Cocculi, *Tincture of Cocculus*,—1 in 8. Dose, ♏ij–xv.

Extractum Cocculi Fluidum, *Fluid Extract of Cocculus.*—Dose, ♏j–iij.

Planat's Tincture of Cocculus,—1 in 4. Dose, ♏j–v.

PHYSIOLOGICAL ACTION.

Picrotoxin is a cerebro-spinal exaltant, affecting especially the centres in the medulla oblongata, and in its action representing the combined action of belladonna and nux vomica. It stimulates all the secretions, especially the cutaneous, the salivary and the intestinal, produces nausea and vomiting, and slows the heart and the respiration after transiently accelerating both. It causes muscular twitching, incoördination, stupor, delirium, epileptiform convulsions, tonic spasms of the flexor muscles alternating with clonic ones, exalted reflexes and trembling,—then coma, insensibility and death by paralysis of the heart, which is arrested in diastole. The action of the drug is on the spasm and vagus centres in the medulla and on Setchenow's inhibitory centre, as well as on the cerebellum and spinal cord, paralyzing the first-named centres and stimulating the reflex centres in the cord. It is eliminated by all the excretory channels, chiefly by the kidneys. The spasms caused by Picrotoxin are choreic and chiefly affect the flexor muscles,—those from Strychnine are tetanic, affecting principally the extensors. The order, succession and character of the phenomena produced by Picrotoxin resemble in marked degree those of the epileptic paroxysm.

Cocculus berries are used to stupefy fish, being thrown into ponds containing them. They are also employed to adulterate beer and porter in order to make these drinks more intoxicating.

Antagonists.

Chloral is antagonistic to its cerebral and spinal actions, but synergistic to its depressant power over the heart and the respiration. *Acetic Acid* gives relief in overdosing, and may have some antidotal power. *Anesthetics* antagonize its spasm-producing action.

THERAPEUTICS.

Picrotoxin is used chiefly in nervous diseases. Epilepsy is amenable to it, especially when the attacks are nocturnal, and in anemic cases and those attributable to onanism. Paralyses of several forms have been greatly benefited by it, especially paralysis of the sphincters, hemiplegia from cold, glosso-labio-laryngeal paralysis and paralysis agitans. Chorea is well treated by it but requires full doses. It is remarkably efficient in controlling the night sweats of phthisis and in flatulent colic, also in dyspepsia with flatulence and severe epigastric pain, and in vomiting with giddiness, headache and intolerance of light and sound. Dysmenorrhea is often benefited by Cocculus administered for two days before the period; and leucorrhea, when the discharge is sero-purulent with lumbar pains, is frequently controlled by it. Parasitic skin diseases are well treated by an ointment of Picrotoxin (gr. x to the ℥) which will also kill pediculi, but it must be used cautiously and with special care to avoid an abraded surface. The tincture of Cocculus may be used undiluted as a wash to kill body-lice.

PILOCARPUS, Jaborandi,—the leaflets of *Pilocarpus Selloanus* and of *Pilocarpus Jaborandi*, Brazilian plants of the nat. ord. Rutaceæ. The word Jaborandi is applied in Brazil to any tree or shrub which possesses the power of inducing sweating, and a number of plants are so designated, but the true leaves are known by their numerous pellucid dots, easily recognized when the leaf is held between the eye and a light. They contain the four alkaloids *Pilocarpine*, $C_{11}H_{16}N_2O_2$, a syrupy fluid, slightly soluble in water, and forming salts; *Jaborine*, isomeric with pilocarpine, but antagonistic thereto in action, and does not form crystallizable salts; *Pilocarpidine*, which acts like pilocarpine; and *Jaboridine*, which is analogous in action to jaborine.

Preparations.

Extractum Pilocarpi Fluidum, *Fluid Extract of Pilocarpus.*—Dose, ♏v–ʒj.

Pilocarpinæ Hydrochloras, *Pilocarpine Hydrochlorate*, $C_{11}H_{16}N_2O_2HCl$,—small, white, deliquescent crystals, odorless, of faintly bitter taste; very soluble in water and in alcohol, almost insoluble in ether or chloroform. Dose, gr. ⅛–½.

PHYSIOLOGICAL ACTION.

Pilocarpus is a paralyzer of the vaso-motor system, and a stimulant of the peripheral terminations of nerves supplying glands and involuntary muscular fibre, subsequently paralyzing the latter. It is therefore a powerful diaphoretic and sialogogue, a cardiac depressant by stimulation of the vagus ends, also myotic, emetic, and under some circumstances abortifacient. Its taste is hot and pungent. It causes prompt and profuse perspiration (℥ix–xv in quantity) and salivation (℥x–xxvij) after a preliminary flushing of the skin. The nasal, bronchial and lachrymal secretions are much increased, sometimes watery diarrhea occurs; the action of the heart at first increased is afterwards lowered, the arterial tension is reduced, and the temperature falls from 1° to 4°. Drowsiness, pallor, chilliness and debility succeed, and last several hours; the pupils are contracted and accommodation is impaired. The elimination of urea is greatly increased, but not the quantity of urine. The respiratory power is lowered, and apnea may occur from increase of the bronchial mucus. Pilocarpus is rapidly diffused and is eliminated by the skin and the salivary glands. Its effects pass off usually in from three to six hours. Children are less affected than adults by proportionate doses. It causes contraction of the bladder, uterus and spleen, in the latter case whether the organ is enlarged or of normal size. The desire to urinate, which is experienced after a full dose, is due to the drug causing contraction of the bladder. Pilocarpus is not a diuretic but tends rather to diminish the quantity of urine as a result of its powerful diaphoretic action.

Pilocarpine is the principle to which the foregoing actions are due, but Jaborine, though chemically identical, is perfectly antagonistic thereto in its effects on the heart, pupils, lungs and salivary glands, acting precisely like atropine on these organs. The difference is probably due to a different molecular arrangement in these agents.

Antagonists and Incompatibles.

Atropine is the antagonist to Pilocarpine, in dose of grain $\frac{1}{100}$ for gr. $\frac{1}{8}$ of the latter. The antagonism between these two alkaloids extends over the whole range of their action, and is the most complete known to physiological experimentation. Conversely *Pilocarpine* is exactly antagonistic to Atropine, but *Jaborine* acts similarly to the latter drug. *Morphine* controls the nausea and vomiting. Caustic alkalies, the persalts of Iron and salts of the metals generally, are chemically incompatible.

THERAPEUTICS.

Pilocarpus is used with great benefit in dropsies, especially the renal form, also in eclampsia of renal origin, in uremia, pleuritis, meningitis and other inflammations of serous membranes, but is contraindicated when from any cause there is a weak heart. In diabetes insipidus it reduces the quantity of urine remarkably, relieving the kidneys by throwing the work on the skin. In the acute and chronic forms of Bright's disease it has been used with advantage, but being very depressant it must be employed with great caution in this disorder. For alopecia it is the most efficient remedy known, stimulating the skin and improving the color and condition of the hair. In agalactia it stimulates the secretion of the milk, and it often gives prompt relief in parotitis. Ptyalism is frequently relieved by minute doses of Pilocarpine (gr. $\frac{1}{80}$), which, acting specifically on the same gland, may correct its morbid action, and similar doses used thrice daily will check profuse perspiration. The hypodermic use of Pilocarpine will arrest a paroxysm of spasmodic asthma and is equally efficient in hiccough. Atropine-poisoning is best combated by the use of Pilocarpine hypodermically.

Diphtheria has been treated with Pilocarpine successfully, Guttmann having reported eighty-one cases without a single death; but other clinicians have not found it so efficient, and Lashkewitz and Jacobi condemn it absolutely. In children above the age of five years, in whom the condition of the heart does not contraindicate it, this drug often gives pronounced satisfaction in detaching the false membrane and preventing its reformation; but care must be taken to give full support by food and alcohol throughout its use, and to avoid it altogether in cases which manifest cardiac weakness or great depression. In erysipelas it is often highly efficient, and for the purpose of breaking up a common cold it is one of the best agents at our command. For the latter purpose the fluid extract of Pilocarpus may be used in doses of ♏x–ʒj according to age, given at bed-time and repeated once or twice during the night if necessary. Children bear it well in all its physiological actions.

Ophthalmologists employ Pilocarpine with most excellent results in the amblyopia of alcoholism and that from the abuse of tobacco, in detachment of the retina, chronic iritis, keratitis, glaucoma, hemorrhage into the vitreous, atrophic choroiditis, white atrophy, to promote resolution and absorption in inflammatory conditions with exudation, and instead of physostigmine as a myotic.

Pilocarpine is highly efficient as an aid to sorbifacient remedies in removing inflammatory exudations and promoting the absorption of effusions. When iodides and mercurials are being used for these purposes their action is greatly aided by this drug administered occasionally for a few days at a time. It has been suggested by Waldstein as a remedy in phthisis for the purpose of inducing leucocytosis and stimulating glandular activity, and is one of the ingredients in a new "cure" for consumption named *Aseptolin*. (See *ante*, page 85.)

PIMENTA, Allspice,—is the nearly ripe fruit of *Pimenta officinalis*, a West Indian tree of the nat. ord. Myrtaceæ. The berries contain a Volatile Oil which [illegible] is official, a green fixed oil, fat, tannin, gum, resin, etc. Dose, gr. x–xl.

Oleum Pimentæ, *Oil of Pimenta*,—the volatile oil, colorless or pale yellow, of aromatic odor, pungent taste and slightly acid reaction. Is a constituent of Bay Rum (Sp[illegible]t. Myrciæ). Dose, ♏ij–vj.

Allspice is a warm, aromatic stimulant, very useful as a condiment, improving digestion by increasing the vascularity of the gastric mucous membrane and by stimulating the salivary secretion. The oil is an agreeable remedy for flatulence, nausea, and intestinal colic, and is used to prevent the griping of purgatives and to cover the taste of nauseous medicines.

PIPER, Pepper, *Black Pepper*,—is the unripe fruit of *Piper nigrum*, or Pepper-vine, a perennial plant of the nat. ord. Piperaceæ, growing in India, Siam, Java, Borneo, etc. It contains a principle, *Piperin*, which is official, also a green, acrid, concrete oil, a balsamic volatile oil, starch, lignin, gum, extractive, etc. Dose, gr. v–xx.

Oleoresina Piperis, *Oleoresin of Pepper*,—contains almost all the volatile oil and acrid resin extracted by ether, with but little of the Piperin. Dose, ♏¼–j.

Piperinum, *Piperin*, $C_{17}H_{19}NO_3$,—a neutral principle prepared from Pepper, and occurring also in other plants of the natural order Piperaceæ. Occurs in colorless [illegible] or pale-yellowish prisms, of neutral reaction, almost insoluble in water, slightly so in ether, but soluble in 30 of alcohol. Dose, gr. j–x.

Piperidinum, *Piperidin* (Unofficial),—is produced by the hydrolysis of Piperin, [illegible] or synthetically by reducing pyridine by nascent hydrogen. It occurs as a colorless, limpid liquid, and is a powerful base. The *Acid Tartrate* is a white, crystalline powder, readily soluble in water, the dose of which is gr. x–xv.

Pepper when applied to the skin acts as an irritant; internally its effects are similar to those of other aromatics, being a warm carminative and stimulant, increasing slightly the action of the heart, stimulating the kidneys somewhat, and toning up the mucous membrane of the urinary and intestinal passages, by which channels it is eliminated. It has been thought to possess antiperiodic power, and was formerly much employed in intermittents. Its chief medicinal use is to correct flatulence, and to excite action of the stomach, being very commonly taken as a condiment with food. It is occasionally employed in gleet, but more extensively in hemorrhoids and other diseases of the rectum. Its active constituents are the concrete oil or resin and the volatile oil, Piperin having very slight action on the system except as an antiperiodic and antipyretic, qualities which it certainly possesses.

Piperidin Tartrate increases the solvent power of serum for sodium biurate to a much greater extent than Piperazin, Lysidin or Urotropin, and has been introduced as a solvent for gouty deposits, uric acid gravel and calculi.

PIPERAZINUM, Piperazin, $C_4H_{10}N_2$ (Unofficial),—is a synthetical basic compound formed by the action of Ammonia upon Ethylene Bromide or Chloride; and occurs as a white, crystalline powder, soluble in water and liquefying when exposed to the air, from which it absorbs water and carbon dioxide. Dose of the base or its hydrochloride, gr. v–xv. It may be injected hypodermically in 3 to 5 per cent. solution.

Piperazin possesses the valuable property of forming with uric acid a very soluble compound, piperazin urate being seven times more soluble in water than is lithium urate, the former requiring but 50 parts and the latter 368 parts of water for solution. It is non-toxic, and devoid of powerful physiological effects, being well borne without ill results, even when administered for prolonged periods. It is non-irritant to mucous membranes, is readily absorbed from the stomach, and circulates in the blood unchanged, reaching the parts affected by gouty deposits in a condition in which it neutralizes and dissolves the latter, thus facilitating their removal from the body.

The administration of Piperazin in gout promptly reduces the redness and swelling of the affected joints, and is frequently followed by a discharge of gravel. The minimum daily dosage for this purpose is about 15 grains, which should be dissolved in half a pint of water, and the solution should be added to a pint or more of any convenient carbonated water, and be taken in divided doses through the day. When there is much pain and fever present, an equal quantity of Phenocoll Hydrochloride may be added,—but in preparing them, each agent should be dissolved separately and then mixed together, otherwise a precipitate will form in the solution. It gives marked relief in the pruritus of the uric acid diathesis due to the irritation of imperfect nitrogenous elimination. In solution it may be introduced into the bladder in order to dissolve vesical calculi of the uric character, and in gout it may be locally employed by hypodermic injection. A one per cent. solution, applied locally to open gouty sores, relieves the pain and reduces the inflammation. It should be tried in rheumatic arthritis of difficult diagnostic differentiation. As a solvent for uric acid and urate concretions Piperazin has been highly praised by many observers and its efficacy disputed by many others. It is patented, which fact, together with its extremely high price, prevents its general use. It is supplied in vials containing 10 grammes (150 grains), which is sufficient for ten days' dosage and may be prescribed in ℥viij of water, of which solution the daily dose would be ℥j (equal to 18¾ grains), taken in a quart or more of any carbonated water during the day in broken doses.

Lysidin (Unofficial),—is a base obtained by the action of sodium acetate upon ethylene-diamine hydrochlorate, and said to possess a solvent power on uric acid five times greater than that of Piperazin. It has been tried in cases of chronic gout with excellent results. The stiffness of the joints was lessened, and a conspicuous reduction occurred in the tophi around the joints, and on the epiglottis in one case. The dose is ʒ ss–ʒ ijss of the 50 per cent. alkaline solution in a glassful of carbonated water.

Lycetol, *Dimethyl-piperazin Tartrate* (Unofficial),—is a new uric acid solvent, which is said to combine the solvent properties of Piperazin with the alkalinizing and diuretic effects of a tartrate. The dose is gr. xv–xxx daily, administered in carbonated water or in the form of a lemonade.

Urotropin (Unofficial),—is prepared by the action of ammonia on formic aldehyde, and occurs as a white, crystalline powder readily soluble in water. It is used as a genito-urinary antiseptic in cystitis and phosphaturia and as a solvent for uric acid. Dose, gr. viij, dissolved in water or carbonated water.

Piperidin Tartrate (Unofficial),—is another powerful solvent of sodium biurate. It is described under the title PIPER, on page 429.

PISCIDIA, Jamaica Dogwood (Unofficial),—is the bark of the root of *Piscidia erythrina*, a tree of the nat. ord. Leguminosæ, growing in the West Indies. It occurs as a tough, fibrous bark, of heavy, narcotic odor, and contains a yellowish, resinoid substance named *Piscidin*. Its active principle has not been isolated. A fluid extract is on the market, of which the dose is ʒ ss–j, carefully increased.

Piscidia has a narcotic effect on many animals, and has been used in Jamaica for many years to stupefy fish, that they may be easily taken. It produces muscular relaxation, incoördination of movement, lowered sensibility, increased action of the heart and increase of the arterial tension by stimulation of the vaso-motor centre. Soon however the heart is weakened, vascular tension falls, and a tetanoid state results from stimulation of the spinal cord, with reduced reflex action. On the brain its effects resemble those of Opium, but it causes deep sleep without any unpleasant after-results. It relieves pain in less degree however than Opium does, but its hypnotic action is greater. It also relieves cough and spasm, produces diaphoresis and salivation and dilates the pupil. From toxic doses death occurs by asphyxia in animals. In man its action is probably the same, but in decidedly less marked degree.

Piscidia is used chiefly as a general nervous sedative. Its hypnotic and anodyne powers are somewhat uncertain, but have in many cases been very decided. It is useful in whooping-cough and spasm, and has proved almost specific in many cases of neuralgia, while in others it has caused great gastric distress without the least anodyne effect.

PIX, Pitch,—is a resinous exudation from the stem of certain trees of the genera *Pinus* (Pines) and *Abies* (Firs and Spruces), and may also be obtained by the evaporation of wood-tar. [See PIX LIQUIDA, p. 431.] The first two of the following varieties are official.

Pix Burgundica, *Burgundy Pitch*,—the prepared resinous exudation of *Abies excelsa* or Norway Spruce (nat. ord. Coniferæ), a native of and Northern Asia. It occurs in hard, brittle, opaque or trans- nass, with a shining, conchoidal fracture, almost entirely soluble al acetic acid. It is very fusible, and at the body-heat it softens omes adhesive. It is used for plasters.

Liquida, *Tar,*—is an empyreumatic oleo-resin obtained by the tive distillation of the wood of *Pinus palustris* and other species s (nat. order Coniferæ). It is thick, viscid, semi-fluid, blackish- of acid reaction, terebinthinate odor, and sharp, empyreumatic lightly soluble in water, soluble in alcohol, in oils and in a solu- potassa or of soda.

tillation Tar yields an acid liquor named *Pyroligneous Acid* and an empyreu- called *Oil of Tar*, (see Oleum Picis Liquidæ, below), the residue being pitch. lar appearance is due to crystals of *Pyrocatechin*, which occur either in the ous Acid or in the tarry mixture. Dose, ʒj–ij daily, in ten-grain doses.

Canadensis, *Canada or Hemlock Pitch* (Unofficial),—is the pre- esinous exudation of *Abies canadensis* (nat. ord. Coniferæ), the k Spruce of the U. S. and Canada. Its properties are much the those of Burgundy Pitch.

Preparations.

astrum Picis Burgundicæ, *Burgundy Pitch Plaster,*—has of Burgundy Pitch Oil 5, Yellow Wax 15.

astrum Picis Cantharidatum, *Cantharidal Pitch Plaster, Warming Plaster,* erate of Cantharides 8, Burgundy Pitch to 100.

n Picis Liquidæ, *Oil of Tar,*—a volatile oil distilled from Tar. Dark, red- vn (almost colorless when fresh), of tarry odor and taste and acid reaction, luble in alcohol. Contains a great variety of compounds, including Hydro- Phenols, Paraffin, etc., among the phenols being Creosote and Carbolic Acid.

pus Picis Liquidæ, *Syrup of Tar,*—has of Tar 7½ per cent.; and is a sweet- -water. Dose, ʒij–℥ss.

entum Picis Liquidæ, *Tar Ointment,*—contains of Tar 50 parts, Yellow ½, Lard 37½. Is irritating unless mixed with finely levigated chalk.

um Picis Liquidæ, *Tar Water* (Unofficial),—made by shaking Tar 1 with frequently during 24 hours, decanting and filtering. Dose, Oj–ij daily.

n Picis Liquidæ, *Wine of Tar* (Unofficial),—Tar ℥xvj, Glycerin, White oney, āā ℥viij, Acetic Acid ℥j, Boiling Water Ovj, shaken together and di- a closed vessel for two hours at 150° to 160° F., then macerated for a few days, y shaken, strained and filtered.

n Pini Sylvestris, *Oil of Scotch Fir* (Unofficial),—a colorless, fragrant oil, from the leaves of *Pinus Sylvestris*, resembling Turpentine in action. Used by n (ʒss to Oj of boiling water), or locally.

ol, *Resinol* (Unofficial),—obtained by the distillation of Burgundy pitch, occurs owish, oily liquid, boiling at temperatures above 536° F. Used as a solvent for of the newer remedies, as Cocaine, Aristol, Iodol; also for Carbolic Acid, Phosphorus and many alkaloids.

entrated Extract of Pinus Canadensis (Unofficial),—is an aqueous, non- stringent, prepared from the *Abies Canadensis* or Hemlock Spruce. It is said specific tonic action upon mucous membranes. Two kinds are sold, one being e White Extract, in reality a golden yellow,—and the other the Dark Extract, r intended for use when it is desirable to avoid staining the linen. This preparation received the endorsement of Dr. J. Marion Sims, and has been extensively employed, both locally and internally, as a topical application in uterine and vaginal catarrhs, and as a systemic remedy in catarrhal inflammation of the gastro-intestinal and broncho-pulmonary mucous membranes.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Pitch is a gentle rubefacient when applied to the skin, but in some constitutions the Burgundy variety causes a vesicular and pustular inflammation if used extensively. It is generally employed as a basis for plasters, and is of benefit in lumbago, rheumatism, chronic pleurisy, painful joints, superficial neuralgiæ, etc., protecting the part from variations of temperature, and perhaps by the gentle pressure exercised stimulating the lymphatics and promoting absorption. It is supposed to have a special influence on the rectum, and in pill with Tar has been employed as a remedy for hemorrhoids. In applying adhesive plasters the hair should first be shaved off, and when about to be removed the plaster should be warmed, and a little oil of turpentine inserted between its edge and the skin. Canada Pitch is too soft for plasters, but is employed for the same purposes as the preceding. A volatile oil obtained from the same tree and named Oil of Spruce or Oil of Hemlock, has been used for abortifacient purposes, endangering the life of the subject.

Tar is a complex mixture of resins and hydrocarbons, containing creosote and carbolic acid, which give to it irritant qualities. Internally it is expectorant, and produces gastro-intestinal irritation, sometimes severe headache, giddiness and febrile phenomena. It is eliminated chiefly by the kidneys, which it stimulates, and may cause their congestion also increased diuresis. Externally it is a decided stimulant to the skin, often giving rise to considerable irritation and pain. It is antiseptic and in most of its effects it resembles the turpentines. Tar is used as a local application in chronic scaly skin diseases, especially psoriasis and chronic eczema. As an atomized inhalation it is of decided benefit in bronchitis, pharyngitis, laryngitis and winter cough. Internally it may be employed with advantage in these affections, also in hemorrhoids, bronchial catarrh and phthisis. The best preparation for internal administration is the syrup, which is a sweetened tar-water, the sugar forming with the Tar soluble compound.

PLANTAGO, Plantain (Unofficial),—is the leaf of *Plantago major* and *Plantag lanceolata* (nat. ord. Plantaginaceæ), the common Ribbed Grass. The pounded leave applied as a paste, or the dry leaf powdered, are actively hemostatic, stopping hemor rhages speedily. Among the ancients it had a good reputation as a remedy for toothach and earache, which still adheres to it in Switzerland and other parts of Europe. I many other painful affections it is extremely efficient, especially in mastitis, rhus-poiso ing, erysipelas, burns, scalds, wounds and bruises. A poultice of the leaves may applied to the affected part, and an infusion administered internally. A fluid extract sold in the shops, of which the dose is ♏v–xv.

PLUMBUM, Lead, Pb,—is not official, but several of its salts are, namely—the Acetate, Carbonate, Iodide, Nitrate and Oxide; of which the *Acetate* is the only one administered internally, the solutions of the *Subacetate* are the only liquid preparations, the *Oxide* (Litharge) is used as Emplastrum Plumbi, the *Nitrate* is used as a local stimulant or escharotic, the *Iodide* as an ointment for absorbent purposes, and the *Carbonate* as an astringent locally to inflamed surfaces. The metal occurs in nature chiefly as a Sulphide named *Galena,* also as an Oxide rarely, and in various other combinations (salts).

Official Salts of Lead.

Plumbi Acetas, *Lead Acetate, Sugar of Lead,*—$Pb(C_2H_3O_2)_2 + 3H_2O$,—colorless, shining, prismatic crystals or scales, efflorescent, of faintly acetous odor and acid reaction, and a sweetish, astringent and metallic taste. Soluble in 2.3 of water and in 21 of alcohol at 59° F., in 0.5 of boiling water and in 1 of boiling alcohol. Dose, gr. ss–v.

Plumbi Carbonas, *Lead Carbonate, White Lead,* $(PbCO_3)_2Pb(HO)_2$,—a heavy, white, opaque powder, odorless and tasteless; insoluble in water or alcohol, but soluble with effervescence in acetic or in diluted nitric acid. Used locally only.

Plumbi Iodidum, *Lead Iodide,* PbI_2,—a heavy, bright citron-yellow powder, odorless and tasteless, fusible and volatilizable by heat; soluble in about 2000 of water at 59° F., and in about 200 of boiling water. Used externally as an ointment. May be given internally in doses of gr. $\frac{1}{3}$ twice daily.

Plumbi Nitras, *Lead Nitrate,* $Pb(NO_3)_2$,—colorless, opaque, octahedral crystals, odorless, of sweetish, astringent and metallic taste and acid reaction; soluble in 2 of water at 59° F., almost insoluble in alcohol. Used locally as an astringent and deodorizer in solutions up to 1 per cent., also as an escharotic and a disinfectant.

Plumbi Oxidum, *Lead Oxide, Litharge,* PbO,—a heavy, yellowish, or reddish-yellow powder, odorless and tasteless; insoluble in water or alcohol, but almost wholly soluble with slight effervescence in dilute nitric acid. When heated in contact with charcoal it is reduced to metallic lead. Used as Lead-Plaster and sometimes with oil as an external application.

Preparations.

Liquor Plumbi Subacetatis, *Solution of Lead Subacetate, Goulard's Extract,*—an aqueous solution containing about 25 per cent. of the salt, prepared from Acetate of Lead 170, Oxide of Lead 100, and Distilled Water to 1000. It is a clear, colorless liquid, of sweetish, astringent taste and alkaline reaction, of sp. gr. 1.195, and when added to a solution of acacia it produces a dense, white precipitate. Used locally as an astringent and cooling lotion, diluted usually with an equal quantity of water.

Liquor Plumbi Subacetatis Dilutus, *Diluted Solution of Lead Subacetate, Lead Water,*—has of the preceding 3, in Distilled Water to 100. Used locally as a mildly astringent and cooling lotion.

Ceratum Plumbi Subacetatis, *Cerate of Lead Subacetate, Goulard's Cerate,*—has of the same solution 20 parts with 80 of Camphor Cerate, freshly prepared as it becomes rancid easily. Used as an astringent and protective application.

Emplastrum Plumbi, *Lead Plaster, Diachylon Plaster,*—Oxide of Lead 32, Olive Oil 60, rubbed together and boiled with 10 parts of water. Is white, pliable and tenacious, free from greasiness or stickiness, and entirely soluble in warm Oil of Turpentine. A protective in abrasions and bed-sores, and the basis of many other plasters.

Unguentum Diachylon, *Diachylon Ointment,*—has of Lead Plaster 50, Olive Oil 49, Oil of Lavender Flowers 1. Used locally in Eczema and other cutaneous disorders.

Unguentum Plumbi Carbonatis, *Ointment of Lead Carbonate,*—has of the Carbonate in very fine powder 10, Benzoinated Lard 90. Used as a dressing for burns.

Unguentum Plumbi Iodidi, *Ointment of Lead Iodide*,—has of the Iodide in very fine powder 10, Benzoinated Lard 90. Used locally to promote absorption.

Oleatum Plumbi, *Oleate of Lead* (Unofficial),—a 20 per cent. solution of Oxide of Lead in Oleic Acid. A soft, yellowish ointment, for local use.

PHYSIOLOGICAL ACTION.

Lead salts are all more or less poisonous, but metallic Lead is inert until converted into a soluble salt by the acids of the stomach. The Acetate in large doses is emetic, so that acute lead-poisoning therefrom is rare. Its chief phenomena are intense gastro-intestinal irritation, vomiting, paralysis, coma and collapse. Chronic lead-poisoning, ***Plumbism***, has its principal sources in *pure* water conveyed by leaden pipes, the use of hair dyes, handling of printing-type, working in the smelting of lead ores, etc. It produces loss of appetite, emaciation, pallor and constipation, followed by slowing of the heart's action, and accompanied by violent colic, muscular impairment evinced by paralysis of the extensor muscles of the forearm (drop-wrist), impaired sensibility and albuminuria. Occasionally aphonia, vertigo, gastralgia, headache, stupor and convulsions are manifested. Rheumatism without fever or tenderness in the joints, which however are red and swollen, is a frequent symptom. A blue line (sulphide) is seen along the margins of the gums in those who do not clean their teeth. Neuralgic troubles may arise and amblyopia often occurs from impairment of the optic nerve. The metal becomes deposited in the affected muscles and other tissues, and probably acts by impairing the isolating power of the nerve-fibres, thus enfeebling the nerve-currents. It also produces contraction of the smaller vessels, and may affect any muscles of the body, also the brain, producing delirium, coma, and convulsions. Abortion is a frequent result, either through an influence on the muscular tissue of the uterus, or from a toxic action on the fetus. Death may occur from extension of the paresis to the muscles of respiration, from gradual impairment of nutrition, or from convulsions and coma, a form of disease known as Lead-encephalopathy.

Astringency is the chief quality of the lead salts; they lessen secretion, contract muscular tissue and then destroy its contractile power, slow both the heart and the respiration, and in time destroy the red blood-corpuscles. Lead enters the blood as an albuminate, in which form also it is retained by the tissues. It is slowly excreted by the liver, kidneys, skin and mammary glands. That which escapes by the bile is reabsorbed by the bowel, and is again excreted by the intestinal glands, escaping with the feces as a sulphide. It lessens the excretion of uric acid.

Antidotes, Antagonists and Incompatibles.

In acute poisoning by lead salts, as by the Acetate, the antidotes are *Sodium* or *Magnesium Sulphate* and Sodium Phosphate. The stomach should be evacuated, and minous drinks and *Opium* given to allay irritation. Chronic poisoning is best treated by *Atropine* and *Iodides*, the latter to saturation of the system. Sulphurated Potassa Baths (℥j or more in water) are also very useful. Incompatibles are Mineral Acids and their salts, vegetable acids, alkalies, vegetable astringents, Potassium Iodide, albuminous solutions, Opium, and all waters containing Lime, Sulphates, Carbonates, and CO$_2$.

THERAPEUTICS.

Lead salts are chiefly used as astringents and hemostatics. The solution of the Subacetate diluted with 4 parts of glycerin and water is locally employed in many skin-diseases, especially in eczema, lichen, impetigo, and erythema; also in catarrhal discharges of muco-purulent character from the ear, vagina, and urethra, particularly gonorrhea and leucorrhea. Inflammations of external parts are constantly treated by the lotion of "Leadwater and Laudanum" (liquor plumbi subacetatis dilutus 7 parts to 1 of tinctura opii). Though the constituents of this lotion are chemically incompatible it is a valuable sedative and astringent. The acetate, in 5-grain doses every three hours, is an efficient internal styptic in various hemorrhages, particularly in hemoptysis, hematemesis, and gastric ulcer, owering the action of the heart and constringing the vessels. Its astringent action is well manifested in bronchorrhea and other pulmonary affections with excessive secretion. It is well used in diarrheas, gr. ij with gr. j of pulverized opium in choleraic diarrhea, and smaller doses for the summer complaint of children. In caseous pneumonia the Acetate is highly recommended as the best remedial agent, combined with opium and digitalis; and in cardiac hypertrophy it may be used to ower the action of the heart. It is also serviceable in whooping-cough with profuse bronchial secretion and in humid asthma.

The Carbonate is only used externally to protect irritated surfaces, as erythema, erysipelas, intertrigo, etc., in which it may be dusted over the surface if unbroken. The official ointment, or white paint mixed with linseed oil, is an excellent application to burns or scalds, but if applied on the broken cuticle it may prove rapidly poisonous. The Iodide is employed externally as an ointment to enlarged lymphatic glands and enlarged spleen, also for chronic eczema and psoriasis. It has been used internally to reduce a malarial spleen.

The Nitrate is an efficient application to fissured nipples, gr. x to ℥j of glycerin. In powder, dusted over unhealthy granulations, and sanious ulcers resulting from onychia, it gives prompt relief after a brief period of pain. It is said to have cured cases of epithelioma when used in the same manner. In solution (gr. x to the ℥) it is a most efficient deodorizer against the fetor from gangrenous sores, ozena and other offensive discharges. Pharmaceutically it is used in the preparation of the Iodide. The Oxide is used in the manufacture of plasters and most of the other alts of lead. It may be used as an external application mixed with sweet oil in superficial burns, but care should be taken that it is applied only to the unbroken skin. It is not employed internally.

PODOPHYLLUM, May Apple,—is the rhizome and rootlets of *Podophyllum peltatum*, the Mandrake, an herbaceous perennial of the nat. ord. Berberidaceæ, growing in the woodlands of Canada and the U. S., having a pale-green stem, with a single white flower at its summit. Its active principle is a *Resin* which is official and is a compound of several resins. It probably contains the alkaloid *Berberine*, which is also found in Berberis, Hydrastis and other plants. Dose, gr. v–xx.

Preparations.

Extractum Podophylli, *Extract of Podophyllum.*—Dose, gr. v–x.

Extractum Podophylli Fluidum, *Fluid Ext. of Podophyllum.*—Dose, ♏j–xxx.

Resina Podophylli, *Resin of Podophyllum, Podophyllin,*—is precipitated from a concentrated tincture by acidulated water. Soluble in alkaline liquids and partly soluble in ether. Contains *Podophyllotoxin* and *Picropodophyllin*, also *Podophyllinic* and *Protocatechuic Acids.* Dose, gr. ⅛–j, in pill. Is an ingredient of Pilulæ Catharticæ Vegetabiles.

Podophyllum is a tonic-astringent and resin-bearing purgative, having action similar to that of jalap but slower, like calomel taking 6 to 10 hours to produce its cathartic effect. It increases the intestinal secretions and the flow of bile, causing copious watery stools, with considerable griping pain and some nausea. The powder is irritant to the respiratory passages and to the skin. The Resin is an excellent purgative in cases of habitual constipation or portal congestion and a useful cholagogue. Laxative effects are produced by small doses (gr. ⅛–¼), but grain-doses are necessary for its full action. It should be combined with hyoscyamus, belladonna or cannabis indica, in order to counteract its griping tendency. It is an efficient derivative in cases of catarrhal or malarial jaundice, and is recommended in very small doses for prolapse of the rectum, remittent fevers of children, dyspepsia, hepatic derangement, bilious vomiting and headache, and in the vomiting and diarrhea of gastro-enteritis.

POLYGONUM, *Smart-weed, Water-pepper* (Unofficial),—is the plant *Polygonum Hydropiperoides*, nat. ord. Polygonaceæ, indigenous to the U. S., having narrow, lanceolated leaves and slender spikes of whitish flowers. It contains *Tannin* and an active principle, *Polygonic Acid*, which is green, crystallizable, insoluble in water, but soluble in alcohol, ether, and chloroform.

Extractum Polygoni Fluidum, *Fl. Ext. of P.* (Unofficial).—Dose, ♏x–ʒj.

Extractum Polygoni, *Extract of Polygonum* (Unofficial).—Dose, gr. j–v.

Smart-weed has a pungent, acrid taste, producing a sensation of heat in the stomach, and a peculiar tingling throughout the system. It stimulates the action of the heart, raises the arterial tension, increases the warmth of the surface, promotes the cutaneous, bronchial and renal secretions and the menstrual flow. It is an efficient diuretic, emmenagogue and aphrodisiac. The juice applied to the skin excites inflammation and vesication.

Amenorrhea from functional inactivity of the uterine system is remarkably benefited by this remedy in ʒss doses of the fluid extract four times daily for a week before the expected period. It has considerable influence over functional impotence, but produces aching pains in the hips and loins, and a sense of weight and fullness within the pelvis. It has been used with benefit in diarrhea, dysentery and gravel, also locally in mercurial salivation and the sore mouth of nursing women.

PONGAMIA, Kurung Oil (Unofficial),—is a yellow oil expressed from the seeds of *Pongamia glabra*, an Indian tree of the nat. ord. Leguminosæ. It has been used for many years in India for skin affections, and in professional hands has proven an excellent application in pityriasis versicolor, rubbed in twice daily. It promises to be a valuable remedy in parasitic diseases of the skin, is not irritating and does not discolor the surface o which it is applied.

POTASSIUM, Kalium, K,—is represented by a number of official salts, which are colorless or white, sometimes anhydrous, and generally readily soluble in water. The metal itself is not official. The chief source of its salts is the ash remaining after the combustion of plants or trees, which contains the Carbonate, from which most of the other salts are prepared. There are also two subsidiary sources,—the Nitrate which is found native, and the Bitartrate, which under the name of *Crude Tartar* or *Argol* is deposited during the fermentation of wine. It is distinguished from all other bases (except magnesium, sodium and ammonium) by not being precipitated by Ammonium Sulphide or Ammonium Carbonate. It is positively known by the violet color it imparts o flame, by its very sparing solubility when converted into the Bitartrate, and by its precipitation by Platinum Perchloride.

Potassium Salts and their Preparations.

Potassa, *Potassium Hydrate, Caustic Potash,* KOH,—a very deliquescent, white, hard and dry solid, of very acrid and caustic taste and strongly alkaline reaction, soluble n 0.5 of water and in 2 of alcohol. It is a powerful and deeply-acting escharotic, and hould be kept in well-stoppered bottles made of hard glass.

Potassa cum Calce, *Potassa with Lime, Vienna Paste,*—a grayish-white, deliquesent powder, consisting of equal parts of Potassa and Lime rubbed together. A milder nd more manageable caustic than the preceding.

Liquor Potassæ, *Solution of Potassa,*—contains about 5 per cent. of Potassium Hydrate, and is prepared by dissolving Potassium Bicarbonate 85, in 400 of Distilled Water, 0 of Lime in the same quantity of Distilled Water, boiling, mixing the solutions gradually, again boiling, and when cold adding Water up to 1000 parts, straining, settling, and decanting the clear solution. Or, by dissolving 56 of Potassa in 944 of Distilled Water. s a clear, colorless, odorless liquid, of acrid and caustic taste, and strongly alkaline eaction. Dose, ♏v–ʒss, well diluted with water.

Potassii Acetas, *Potassium Acetate,* $KC_2H_3O_2$,—a white, satiny, crystalline mass, very deliquescent, odorless, of pungent, saline taste, and a neutral or faintly alkaline eaction, soluble in 0.4 of water and in 1.9 of alcohol at 59° F. Dose, gr. v–ʒj.

Potassii Carbonas, *Potassium Carbonate,* K_2CO_3,—a white, crystalline or granular powder, very deliquescent, odorless, of alkaline taste and reaction, soluble in 1.1 of water at 59° F., insoluble in alcohol. Dose, gr. ij–xx.

Potassii Bicarbonas, *Potassium Bicarbonate,*—$KHCO_3$,—colorless prisms of saline and alkaline taste and alkaline reaction, soluble in 3.2 of water at 59° F., decomposed by boiling water, almost insoluble in alcohol. Dose, gr. v–xxx.

Potassii Chloras, *Potassium Chlorate,* $KClO_3$,—colorless prisms or plates, of pearly lustre, of cooling, saline taste and neutral reaction, soluble in 16.7 of water at 59° F. and in 1.7 of boiling water; slightly soluble in mixtures of alcohol and water, insoluble in absolute alcohol. Dose, gr. v–xx.

Potassium Chlorate should be kept in glass-stoppered bottles, and great caution should be observed in handling the salt, as dangerous explosions are liable to occur when it is mixed with organic matters (cork, tannic acid, sugar, etc.), or with sulphur, antimonium sulphide, phosphorus, or other easily oxidizable substances, and either heated directly or subjected to trituration or concussion. It should not be mixed with glycerin in the presence of a free acid. [For the combination of this salt with the tincture of the chloride of iron, see *ante*, page 267.]

Gargarysma Potassii Chloratis, *Potassium Chlorate Gargle* (Unofficial),—has of the salt ʒj, in Glycerin ʒiv and Water to ℥vj.

Trochisci Potassii Chloratis, *Troches of Potassium Chlorate,*—each troche contains about 4½ grains of the salt, with sugar, tragacanth, and spirit of lemon. Dose, j–iij, slowly dissolved in the mouth.

Potassii Citras, *Potassium Citrate,* $K_3C_6H_5O_7 + H_2O$,—transparent, prismatic crystals, odorless, of cooling, saline taste, and neutral reaction, soluble in 0.6 of water, very soluble in boiling water, sparingly soluble in alcohol. Dose, gr. x–xxx.

Potassii Citras Effervescens, *Effervescent Potassium Citrate,*—consists of Pot. Bicarb. 90, Citric Acid 63, Sugar 47, powdered, mixed to a paste, dried and again powdered. Dose, ʒj–ij, in a glass of water, as an effervescent drink.

Liquor Potassii Citratis, *Solution of Potassium Citrate, Mistura Potassii Citratis,*—contains about 9 per cent. of the anhydrous salt, together with small amounts of citric and carbonic acids. Prepared by dissolving Citric Acid 6, and Pot. Bicarb. 8, each in water 40, filtering the solutions separately, and adding in each case enough water to bring to 50 parts, then mixing the two together. Dose, ℥ss–℥j or more.

Potassii Nitras, *Potassium Nitrate, Saltpetre, Nitre,* KNO_3,—colorless, transparent prisms or a crystalline powder, of pungent, cooling and saline taste and neutral reaction; soluble in 4 of water at 59° F. and in 0.4 of boiling water; almost insoluble in alcohol. Is a constituent of Argenti Nitras Dilutus. Dose, gr. v–xx, well diluted.

Charta Potassii Nitratis, *Potassium Nitrate Paper,*—is unsized paper immersed in a solution of 20 parts of the salt in 80 of distilled water, and dried. Used for inhalation, the fumes from the burning paper being inhaled in asthma.

Potassii Sulphas, *Potassium Sulphate,* K_2SO_4,—colorless, hard, rhombic prisms, of sharp, saline and bitter taste and neutral reaction, soluble in about 9.5 of water at 59° F., and in 4 of boiling water, insoluble in alcohol. Dose, gr. xx–℥ss, well diluted.

Potassii Bitartras, *Potassium Bitartrate, Acid Tartrate of Potash, Cream of Tartar,* $KHC_4H_4O_6$,—colorless rhombic crystals, or a white, gritty powder, of acidulous taste and acid reaction; soluble in about 201 of water at 59° F., and in about 16.7 of boiling water, very slightly soluble in alcohol. Is a constituent of Pulvis Jalapæ Compositus. Dose, gr. xx–ʒj (diuretic and refrigerant), ℥ss–j (purgative).

Potassii et Sodii Tartras, *Potassium and Sodium Tartrate, Rochelle Salt,* $KNaC_4H_4O_6 + 4H_2O$,—colorless, rhombic crystals, or a white powder, of cooling and slightly saline and bitter taste, and neutral reaction; soluble in 1.4 of water at 59° F., very soluble in boiling water, almost insoluble in alcohol. Is a constituent of the following preparation. Dose, ℥ss–j.

Pulvis Effervescens Compositus, *Compound Effervescing Powder, Seidlitz Powder,*—each powder has of the preceding salt 120 grains, of Sodium Bicarbonate 40 grains, mixed in one paper; and of Tartaric Acid 35 grains in another paper. Dose, 1 to 2 pair, dissolved separately in water and the solutions poured together.

Potassii Silicas, *Potassium Silicate, Soluble Glass,* K_2SiO_3 (Unofficial),—is used in solution of a syrupy consistence for the preparation of immovable dressings for fractured limbs, etc. [See under SILICATES.]

The **Arsenite** is described under ARSENUM,—the **Bromide** under BROMUM,—the **Bichromate** under ACIDUM CHROMICUM,—the **Iodide** under IODUM,—the **Cyanide** and **Ferrocyanide** under ACIDUM HYDROCYANICUM,—the **Hypophosphite** under PHOSPHORUS,—the **Permanganate** under MANGANUM,—the **Nitrite** under AMYL NITRIS,—and **Sulphurated Potassa** under SULPHUR.

PHYSIOLOGICAL ACTION.

Caustic potash, like other caustic alkalies, destroys the tissues by combining with their water, dissolving the albumin and saponifying the fats, and converting the tissue to which it is applied into a moist, gray slough, with considerable surrounding inflammation. Internally it acts as a powerful corrosive poison, destroying the mucous membrane of the parts with which it comes in contact, and giving rise to intense pain, diarrhea, convulsions and delirium. Unless speedily rejected or neutralized it causes death from inflammation of the larynx, from the gastro-intestinal lesions, or after some time from stricture of the esophagus. Liquor Potassæ, containing over 5 per cent. of the pure Potash, possesses in a degree the same caustic properties, and should never be administered undiluted. It neutralizes the acids in the stomach, and in the blood exists chiefly as the carbonate, being eliminated with the urine which it renders alkaline. If its use be continued too long it impairs the blood, and renders the subject anemic.

Potassium Salts in large doses are cardiac poisons, muscular paralyzers, poisonous to protoplasm especially nerve tissue, and destructive to the ozonizing function of the blood. They increase the saliva, promote oxidation and stimulate retrograde metamorphosis, and are therefore waste-producers. In small doses on an empty stomach they promote the formation of acid gastric juice by favoring the outward osmosis of its constituents from the blood; in larger doses they act chemically on the stomach contents, neutralizing its free acids, and disordering digestion. The Bicarbonate, given on an empty stomach, enters the blood unchanged, meets the neutral phosphate of sodium and is decomposed, acid phosphate of sodium being formed which renders the urine more acid. On a full stomach it is decomposed by the acids of the gastric juice, increases the alkalinity of the blood and makes the urine less acid. The salts of potassium with vegetable acids (Acetate, Citrate, Tartrate, etc.) enter the blood in their own form, are there decomposed, forming free CO_2, and are converted into alkaline carbonates in which form they are eliminated, alkalinizing the blood and the urine. They are diuretics also, increasing the urinary water and solids, but decreasing the uric acid by causing increased oxidation. The mineral salts (Nitrate, Chlorate, etc.) are not decomposed in the blood, but are eliminated in their own form, the Nitrate being a most active diuretic, the Chlorate irritating the kidneys, depressing the heart, causing albuminuria, and impairing the ozonizing function of the blood. In large doses these salts decompose the red blood-corpuscles and paralyze the motor ganglia of the heart. The Chlorate does not part with its oxygen in the system, as generally believed.

The Sulphate is chiefly purgative in its action, but acts harshly, and in overdoses has caused death.

The action of the remaining Potassium salts is described under the titles of their acid and other constituents, to which their effects are chiefly referable.

Antidotes and Incompatibles.

Poisoning by caustic alkalies is treated by the dilute *Vegetable Acids*, as vinegar, cider, lemon-juice;—then demulcent drinks and oils to protect the mucous membrane, and the usual measures to support vitality. The Alkalies and their Carbonates are incompatible with the acids and also with metallic salts, and the Caustic Alkalies decompose most of the alkaloids.

THERAPEUTICS.

Caustic Potash is used locally to destroy morbid or cicatricial tissue, to cauterize the wounds resulting from bites of animals or stings of insects, to form issues or to open deep-seated abscesses, or to destroy chancres, malignant pustules, nevi, warts, etc. Its action is deep and severe, and it is best employed in the form of Potassa cum Calce, which is a far more manageable preparation.

Liquor Potassæ is used internally as a free alkali to neutralize excess of acid in the stomach, blood and secretions, and as an antilithic in the uric acid diathesis, also for acne, boils, and obesity. Locally it is employed to soften the nail in in-growing toe-nail, and diluted to relieve pruritus and to remove scales in various skin-diseases. In small doses with a vegetable bitter tonic before meals it acts well in atonic dyspepsia, increasing the flow of the gastric juice by direct stimulation of the gastric mucous membrane. If given after meals in acid dyspepsia large doses are necessary for temporary alleviation by neutralizing the food acids. These remarks concerning acidity and dyspepsia apply equally well to the Bicarbonate, which is used for the same purpose, and while possessing all the virtues of the potassium salts is without any corrosive or irritant action. It is also useful in simple gastralgia or cardialgia; and in cystitis, gonorrhea, etc., where there is acid urine, it renders the urine less irritating and soothes the inflamed surfaces. Acute and chronic rheumatism and rheumatoid arthritis are much benefited by an alkaline treatment in patients of sufficient bodily vigor to stand its lowering effects. The Bicarbonate is also used to alkalinize the blood and secretions in lithemia, jaundice, many cutaneous eruptions, and in diabetes; also locally as a lotion for fetid perspiration of the feet and axillæ, acne, and acute eczema. The Carbonate is diuretic, antacid and antilithic, but is seldom used internally being too irritant, and the Bicarbonate having all its virtues without its objectionable qualities. Locally a solution (ʒj to the ℥) is said to be effectual as a remedy for pruritus vulvæ, and one of half the above strength is used in freckles, sunburn and tan of the epidermis, in moist eczema and the itching of urticaria.

The Acetate and Citrate are good purgatives in doses of ʒij to ʒiv, and in smaller doses are employed as alkalinizers of the blood and urine and as diuretics. Of the vegetable potassium salts the Acetate is the most certain diuretic, the Bitartrate is the most active cathartic, while the Citrate is the most reliable diaphoretic and the best to alkalinize the urine, it having the least injurious effect on the blood and on the digestion. In lithemia the first and last of these salts are given to promote oxidation, and by keeping the urine alkaline they may reduce small calculi of the uric acid variety. In acute rheumatism and fevers they act as antacids in the blood, as febrifuges by promoting diaphoresis, and as sedatives to the general nervous system. As an agreeable laxative no preparation surpasses the Bitartrate in 2 to 4 drachm doses made into a paste with orange marmalade or any other conserve. It is also used as a diuretic in general cardiac dropsy and in acute desquamative nephritis. In cases of acute dysentery with scorbutic symptoms, as seen among miners, sailors, etc., a full purgative dose of this salt (℥ss or more) has acted most beneficially as a preliminary to other treatment, and in many cases has proven to be the only remedy required. In the acute diarrhea of soldiers it is usually promptly curative. Being an acid salt its internal administration will in many cases acidify an alkaline urine.

Potassium Chlorate is employed locally in solution (ʒss to the ℥) as a deodorant and detergent wash in inflamed, ulcerated and aphthous conditions of the mouth. On unhealthy mucous membranes it exercises an alterative action for the better, but if long used it will keep up a state of chronic irritation. In mercurial salivation it is of great benefit, and in dilute solution (gr. x to the ℥) it is an efficient application to unhealthy sores and ulcers, as a wash for foul sinuses or cavities, and as an injection in chronic affections of the bladder. The powdered salt may be applied to aphthæ, and dusted over epithelioma will alter the action, diminish the pain, check the growth and promote cicatrization. Internally this salt has been administered in the idea that it parts with its oxygen in the system, but it is now acknowledged that it is excreted unchanged. Setting up congestion and irritation of the kidneys it is highly dangerous in large doses or if used for any length of time, but is constantly administered in diphtheria, chronic bronchitis, purpura, hematuria, ovarian tumor, pseudo-membranous laryngitis, scarlatina, typhoid fever and chronic cystitis. When used internally it should be given in small doses (gr. xx in 24 hours for an infant, gr. xxx in 24 hours for a child of 2 to 4 years, and ʒiss for an adult in the same time), and the action of the heart and the kidneys should be carefully watched. It should never be prescribed with potassium iodide lest the poisonous Iodate be formed, nor with the syrup of the iodide of iron, lest it liberate the Iodine, and cause severe gastritis. Strong acids and acid sulphates decompose it, and it forms explosive compounds with easily oxidizable substances, as sugar, sulphur, tannin, sodium or potassium hypophosphites, catechu, glycerin, etc. For the combination of Potassium Chlorate with the tincture of the chloride of iron, as a gargle, see under CHLORUM.

The Nitrate has been much employed as a refrigerant diaphoretic and diuretic in febrile and inflammatory affections, especially in inflammation of the trachea and bronchi, pneumonia and rheumatism, but its action is uncertain, and it is now giving place in these disorders to more efficient agents. The fumes of burning nitre paper (Charta Potassii Nitratis) are a useful inhalation in some forms of spasmodic asthma. The Sulphate is used in teaspoonful doses in water as an hepatic stimulant and a mild cathartic, increasing the secretions of the intestinal glandular apparatus. Its action is sometimes harsh, and death has resulted from overdoses. Potassium and Sodium Tartrate, Rochelle Salt, is the chief aperient agent in Seidlitz Powders. In doses of ℥ss–j it is a gentle and cooling laxative, and in drachm doses frequently repeated it is used to render the urine alkaline and as an antilithic.

The therapeutics of the other Potassium Salts are described under th[illegible] respective titles of their more active bases.

PRINOS, Black Alder (Unofficial),—is the bark of *Prinos verticillatus*, or Winter[illegible]berry, a shrub of the nat. ord. Aquifoliaceæ, indigenous to Canada and the U. S., havin[illegible] small, white flowers, and a globose, six-seeded, bright-red berry, which grows in cluster[illegible]s and is persistent all winter. It contains an amorphous, yellow and bitter principle, als[illegible]o tannin, sugar, starch, wax, resin, etc. The bark may be given in substance in doses o[illegible]f ʒss, or a decoction (ʒij in Oiij boiled to a quart) in doses of ℥j–ij.

Black Alder is astringent and tonic, and has been used in intermittent fever, diarrhe[illegible], and chronic cutaneous diseases. In the latter class of disorders it may be applied locall[illegible].

PRUNUM, Prune,—is the fruit of *Prunus domestica*, the Plum tree (nat. ord. Ros[illegible]aceæ), indigenous to Western Asia, but cultivated in most countries of temperate climat[illegible]e. Prunes contain sugar, pectin, albumin, malic acid and salts. They are a constituent [illegible]f Confectio Sennæ. The root-bark contains a glucoside *Phloridzin*, which causes gly[illegible]osuria in animals (see below, under PRUNUS VIRGINIANA).

Prunes are laxative and nutritious, and are freely used as a food and sweetmeat, but [illegible] in excess may give rise to flatulent colic from the indigestibility of their skins. Stew[illegible]ed prunes is an excellent dish for constipation in children, and may be made more effect[illegible]ve by the addition of a little Senna.

PRUNUS VIRGINIANA, Wild Cherry,—is the bark of *P[illegible]unus serotina*, the Wild Cherry, a large forest tree of the nat. ord. Rosace[illegible]æ, growing in Canada and the U. S. On maceration in water it develop[illegible] a distinct odor of bitter almonds. It contains tannin, gallic acid, res[illegible]n, starch, etc., also *Amygdalin* and *Emulsin*, which by their mutual react[illegible]on in the presence of water, produce *Hydrocyanic Acid* and a *Volatile* [illegible]*il* resembling that of Bitter Almond. [See *ante*, pages 99 and 148.] [illegible]he root-bark contains a glucoside, *Phloridzin*, also found in the same part[illegible] of the apple, pear and plum trees, which causes glycosuria in animals [illegible]nd man when given by the mouth, intravenously or hypodermically. Dose of the powdered bark, ʒss–j.

Preparations.

Extractum Pruni Virginianæ Fluidum, *Fl. Extr. of Wild Cherry.*—Dose, ʒss–j.

Infusum Pruni Virginianæ, *Infusion of Wild Cherry,*—4 per cent. Dose, ℥ss–j. Should be made with cold water.

Syrupus Pruni Virginianæ, *Syrup of Wild Cherry,*—15 per cent. Dose, ʒj–iv.

Physiological Action and Therapeutics.

Wild Cherry is an aromatic bitter tonic, increasing appetite, aiding digestion, and thus promoting the constructive metamorphosis. The presence of a volatile oil gives it a local stimulating action on the alimentary canal in common with serpentaria, cascarilla and other members of the same class. Hydrocyanic Acid being yielded by it in the presence of cold water, imparts a sedative action to its preparations, calming irritation and diminishing nervous excitability. Very large doses reduce the action of the heart. The glycosuria previously mentioned as caused by Phloridzin, the glucoside found in the root-bark, differs from that of true diabetes in the fact that the sugar of the blood is not increased in amount; hence it is not due to any change in the general metabolism of the body, but to some alteration of the renal epithelium, by which the blood sugar escapes into the urine instead of being retained in the body and used as a source of energy (Cushny).

The preparations of Wild Cherry are used in catarrhal conditions of the bronchial mucous membrane, also in the hectic of phthisis and scrofula, with palpitation of the heart and a debilitated stomach; a collection of symptoms often observed in consumptive subjects, for whom it is a very useful palliative. Cough is supposed to be especially amenable to its influence, and hence it has become a matter of daily routine to prescribe the syrup as an ingredient of cough-mixtures. The infusion is an excellent stomachic tonic, and may be administered with great benefit in dyspepsia and in convalescence from acute disease.

PULSATILLA,—is the herb, collected soon after flowering, of *Anemone Pulsatilla* and *Anemone pratensis* (*Pulsatilla nigricans*), the Pasque-flower or Meadow Anemone, small herbal plants of the Ranunculaceæ, to which order Aconite also belongs. They inhabit Europe and Siberia, and have large, purple flowers, which are inodorous and very acrid. Pulsatilla contains an acrid yellow oil, which in the presence of water is gradually changed into *Anemonin,* $C_{15}H_{12}O_6$, or Pulsatilla camphor, the active principle, and *Anemonic Acid,* $C_{15}H_{14}O_7$, a white, crystalline, tasteless and apparently inert substance, which may also be formed by the action of alkalies on Anemonin. The herb should be carefully preserved and not kept longer than one year. Dose, gr. j–v.

Anemone patens or *Pulsatilla nuttaliana*, is an inhabitant of the United States, sometimes has whitish-colored flowers, and was formerly one of the official sources of the drug.

Preparations.

The herb alone is official, but a tincture may be prepared according to the pharmacopœial directions for Tincturæ Herbarum Recentium (1 part in 2 of alcohol), the dose of which is ♏ $\frac{1}{10}$–♏ x, several times a day. The imported German homeopathic tincture contains equal parts of the expressed juice and alcohol, and is an efficient preparation; but tinctures or fluid extracts made from the imported dried plant are not trustworthy.

Anemoninum, *Anemonin* (Unofficial),—a volatile, unstable, camphoraceous principle, crystallizable, soluble in chloroform and in hot alcohol, almost insoluble in water and in ether. Dose, gr. $\frac{1}{6}$–$\frac{1}{2}$ in pill; but much larger doses may be taken without inconvenience, as much as two grains having produced no physiological symptoms in man (Schroff).

PHYSIOLOGICAL ACTION.

Pulsatilla is an active irritant when locally used; the oil vesicates the skin, and the fresh juice produces tingling and burning sensations in a part to which it is applied. It may excite a violent dermatitis, with a vesicular or pustular eruption, and inflammation and even gangrene of the entire limb has followed the application of the bruised root to the calf of the leg for rheumatism. Inhalation of its dust has produced itching of the eyes, colic, vomiting and diarrhea; and swallowing the fresh herb may cause severe irritation of the gastro-intestinal mucous membrane. The fresh juice applied to the tongue gives rise to tingling and burning sensations followed by numbness, symptoms very like those caused by Aconite. Internally administered Pulsatilla is diuretic, diaphoretic and emmenagogue, and also acts as a cardiac and vascular sedative, lowering the action of the heart, the arterial tension and the body-temperature. In overdoses it strongly affects the mucous membranes, and produces nausea and vomiting, slimy diarrhea, bloody urine, profuse and offensive sweats, coryza and cough; also vesicular and pustular eruptions on the skin, peculiar pains in the eyes and dimness of vision. Its primary action is that of a spinal irritant, secondarily it produces exhaustion and paralysis of both motion and sensation. Stupor, coma and convulsions may be caused by a toxic dose, also paralysis of the cord and medulla. Most of these effects have been observed on rabbits, and the pharmacology of the drug is not yet accurately worked out. The homeopathic writers credit it with specific influence on the synovial membranes, the veins, the ears, and the generative apparatus of both sexes.

Anemonin was discovered in 1771 by Störck, and its effects have been studied to some extent on animals. When applied to the conjunctiva it caused slight inflammation thereof, and placed on the human tongue it left a slight burning sensation. When melted, its vapor produced intense inflammation of the eyes and pricking sensations in the tongue followed by numbness and white patches. The symptoms following its internal administration in fatal doses were a slow and feeble pulse, slow respiration, lowered body-temperature, frequent diarrhea, paralysis of first the hind- and then the fore-legs, dyspnea, mydriasis followed by myosis, stupor and death without convulsions. The absence of the latter is thought to be due to a paralyzing action of this principle on the cerebral motor centres, as in poisoning by extract of Pulsatilla convulsions are always present. The autopsies showed congestion and edema of the lungs, also marked hyperemia of the cerebral and spinal membranes, especially in the vicinity of the medulla. The heart walls were relaxed, and its cavities and the great vessels filled with dark and clotted blood, while the blood elsewhere was fluid. The liver, spleen, kidneys and abdominal viscera were found to be healthy.

Antagonists and Incompatibles.

Alcohol, *Opium* and Digitalis are its physiological antagonists. *Tannic Acid*, the caustic alkalies and the metallic salts are chemically incompatible with preparations containing Pulsatilla or Anemonin.

THERAPEUTICS.

The ancient writers credited different species of Anemone with many medicinal virtues, but the modern use of this drug dates from the time of Baron Störck and his contemporaries (1770–1800) who highly praised the Pulsatilla nigricans as a remedy for corneal opacities, cataract, paralysis, rheumatism, amenorrhea, melancholia, secondary syphilis, old ulcers and scaly skin diseases. Later therapeutists differ widely as to the medicinal value of this drug, some giving it extravagant praise and others finding no efficacy in it. It is quite possible that no effects whatever would be obtained if an old preparation or even a fresh one from the dried herb were employed. It has proved very efficient in acute catarrhal affections of the mucous membranes, especially rhinitis and conjunctivitis, in the early stage of the purulent ophthalmia of children and in gonorrheal ophthalmia, also in subacute and chronic bronchitis of delicate persons accompanied with profuse mucous expectoration, and in chronic catarrh of the bladder. It is used with benefit in chronic nasal catarrh with a thick though bland discharge, also in acute and subacute inflammation of the middle ear and the lining of the external auditory canal so often seen in children, where the membrane is red and swollen, with severe pain, and later on a thin, acrid discharge, which is often bloody and soon becomes puriform. In these affections medium doses (♏ v) of the tincture may be given internally every four hours to adults, and a lotion composed of ʒj–ij in ℥vj of warm water may be applied to accessible parts. A similar use of this agent has been of decided benefit in many cutaneous affections, especially eczematous eruptions, syphilides, and indolent ulcers.

In acute and chronic dyspepsia, characterized by gastric catarrh or subacute gastritis with a white-coated tongue, no taste or a greasy sensation in the mouth, nausea, flatulence, heart-burn, sick headache, anorexia, depression, diarrhea, etc., Pulsatilla is a very efficient remedy, given in medium doses, ♏v of the tincture every four hours. It does good service in intestinal catarrhs, shown by passive, mucous diarrhea with little pain, which are frequently seen in the febrile affections of childhood, especially measles, mumps, chicken-pox and remittent fever.

Pulsatilla is generally credited with specific therapeutical action on the generative organs of both sexes. Epididymitis and orchitis have been often controlled and entirely dissipated by its administration in very small doses, a few drops of the tincture in a glass of water, of which ʒj is given every two hours (Piffard, Sturgis). In more than 24 cases of acute uncomplicated epididymitis, doses of two drops of the tincture every two hours gave immediate relief, the patients wearing a suspensory bandage but not being confined to bed (Borcherin). Doses of five drops aggravated this disorder, while those of ♏$\frac{1}{10}$ every three hours proved curative (Piffard). In functional amenorrhea, in scanty or delayed menstruation, and in suppression thereof from fright or cold, in ovaritis and in simple leucorrhea with back-pains and nervous depression, it has been found an excellent remedy. Dysmenorrhea has been removed in several cases by two-drop doses of the tincture given thrice daily for several days before the menstrual epoch (Piffard). Extravagant opinions as to its virtues in the puerperal state, and during parturition are promulgated by the homeopathists, and their authorities on materia medica credit this drug with power to rectify false presentations during labor by causing version of the child.

Besides the catarrhal affections of the ocular mucous membrane already mentioned, Pulsatilla has remedial power in certain affections of the eyelids. Its internal administration is said to effectually blight a stye if given early, but will not prevent its recurrence. It is an efficient remedy in recent blepharophthalmia, with profuse lachrymation and meibomian secretion; and it is said to stop twitching of the lids accompanied by photophobia. It has been used with decided benefit in the earache of children and in recent catarrhal deafness, also in acute cerebral and spinal meningitis, eclampsia from various causes, asthma, subacute rheumatism of the small joints, acute rheumatic gout, left-sided clavus, hemicrania and infra-mammary pain. Denian used this drug with benefit in several nervous affections, and concludes that it is a direct sedative of nervous irritability, but only indirectly a sedative to the circulation. Tucker found it especially serviceable in the nervous headache produced by overtaxing the mind. An extract of the root has proved to be an efficient teniafuge. Coughs which are loose by day, but dry and tickling in character on lying down at night, are greatly benefited by small doses of the tincture frequently repeated; and Anemonin, in doses of gr. ss–j, has been extremely useful in whooping-cough and coughs of irritative character.

PYRETHRUM, Pellitory,—is the root of *Anacyclus Pyrethrum*, a plant of the nat. ord. Compositæ, native of Northern Africa, but cultivated in Europe. It contains an alkaloid *Pyrethrine*, also inulin, tannin, mucilage, etc., with a brown *Resin* and two fixed oils. Dose, as a masticatory, ʒ ss–j.

Pyrethrum Roseum, *Persian Pellitory* (Unofficial),—is indigenous to Western Asia, and resembles Chamomile in appearance. The flower-heads are used in powder to kill insects, 4 grains killing a fly in a vial in 2 or 3 minutes.

Tinctura Pyrethri, *Tincture of Pyrethrum*,—20 per cent. Not used internally.

Pellitory is an irritant sialogogue. When chewed it causes a pricking sensation in the tongue and fauces, with heat, acridity, pungency and a copious flow of saliva and buccal mucus. Large doses may cause bloody diarrhea, tetanoid spasms, accelerated pulse, and profound stupor. Applied to the skin it acts as a rubefacient, the powder inhaled as a sternutatory. It stimulates the local nerves and vessels of the mouth and salivary glands by direct irritant action, but soon depresses the nerves and blunts their sensibility.

Pellitory is chewed as a masticatory and sialogogue in paralysis of the tongue, rheumatic and neuralgic affections of the head and face, and pain from carious teeth. Its powder has been recommended as a sternutatory in chronic catarrh of the frontal sinuses. As a gargle or lotion (ʒ iij to Oj) it is very useful for relaxed uvula and as a mouth-wash. When used for toothache a few drops of the tincture should be inserted into the cavity on cotton or wool. Used as a sialogogue it is an efficient agent to secure the rapid elimination of Iodine from the system in chronic poisoning thereby.

QUASSIA,—is the wood of *Picræna excelsa*, a tree of the nat. ord. Simarubeæ, indigenous to Jamaica and other West Indian islands. Surinam Quassia, used in Europe, is the wood of *Quassia amara*. Both varieties, as met with in the shops, occur as chips or raspings, of a yellowish-white color, inodorous but intensely bitter. The wood is turned into cups, which are sold under the name of quassia- or bitter-cups. It contains a bitter principle, *Quassin*, $C_{31}H_{42}O_9$, which is crystalline, soluble in hot alcohol and in chloroform, slowly in cold water, faster in alkaline or acidulated water. Dose of the powdered wood, gr. xx–xxx.

Preparations.

Extractum Quassiæ, *Extract of Quassia*,—aqueous. Dose, gr. j–iij.

Extractum Quassiæ Fluidum, *Fluid Extract of Quassia*.—Dose, ʒ ss–j.

Tinctura Quassiæ, *Tincture of Quassia*,—strength 10 per cent. Dose, ♏v–ʒj.

Infusum Quassiæ, *Infusion of Quassia* (Unofficial),—made with cold water ℥x, Quassia chips ʒj, macerated for ½ hour and strained. Or water poured into a quassia-cup and left standing will give a good infusion. Dose, ℥j–iij.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Quassia is a simple bitter, having no flavor, but is intensely bitter and less agreeable than either Gentian or Chiretta. It is fatal to flies and fish, and makes an excellent anthelmintic enema against the thread-worm. A concentrated preparation is poisonous to rabbits and dogs, and has produced very alarming narcotic symptoms in a four-years-old child. Its action is that of a bitter stomachic tonic, as described under CALUMBA.

The preparations of Quassia contain no tannin and hence may be prescribed with salts of Iron. It is chiefly employed in atonic dyspepsia with pain after eating, and vomiting or regurgitation of food, also in atonic diarrhea depending on indigestion or an irritable condition of the intestinal mucous membrane. It is useful in convalescence to promote the appetite and digestion, and with sodium bicarbonate in gastric vertigo. It has been used as a feeble antiperiodic, and in hysteria its repulsiveness is an aid to its medicinal action. The strong infusion used as an enema is an effective remedy against the thread-worm (oxyuris vermicularis).

QUERCUS ALBA, White Oak,—is the bark of *Quercus alba*, the White-oak tree (nat. ord. Cupuliferæ). It contains a variety of tannin named *Quercitannic Acid,* $C_{28}H_{24}O_{12}$, also *Pectin* and a bitter principle named *Quercin,* but no gallic acid. There are no official preparations, but a decoction (℥j ad Oj) may be used in doses of ℥ss–j.

Quercus Tinctoria, *Black Oak Bark,*—formerly official, contains a yellow coloring principle named *Quercitrin,* also *Quercitannic Acid,* etc.

Quercus Lusitanica is the source of Galls (see under GALLA).

Oak-bark is astringent and tonic, but is seldom used internally. Its actions and uses are those of Tannic Acid. The decoction is much used in country practice as a cheap astringent application for injection in leucorrhea, prolapsus ani, hemorrhoids, etc., and as a gargle in faucial inflammation and prolapsed uvula. It has also been used as an injection into dropsical cysts, and as a lotion for flabby ulcers and suppurating wounds. The powdered bark as a poultice has proved an excellent application in gangrene, and in finely pulverized state it is a useful ingredient of tooth-powders. A concentrated fluid extract is used in the Heaton-Warren operation for the radical cure of hernia, by injection into the tissues around the margin of the ring, with the object of exciting inflammation and occlusion of the opening.

QUILLAJA, Soap Bark,—is the inner bark of *Quillaja Saponaria,* a tree of the nat. ord. Rosaceæ, indigenous to Peru and Chili. It contains calcium sulphate crystals, also starch and the glucoside *Saponin,* $C_{32}H_{54}O_{18}$, a white, amorphous, sternutatory powder, soluble in water and in dilute alcohol. The Infusion of Quillaja foams like soap-water. The only official preparation is the tincture.

Tinctura Quillaja, *Tincture of Quillaja,*—20 per cent. Dose, ♏v–xxx.

Quillaja in powder is sternutatory and causes the water in which it is macerated to h, making emulsions of oil, and being used instead of soap for washing purposes in us affections of the skin, also to stimulate the growth of the hair in alopecia. Its

due to the glucoside Saponin, which is found also in Senega and in a
r plants, and is a violent irritant of the respiratory passages, a local anes-
yretic, a powerful paralyzant of the heart and respiration, and a poison
muscles. It has not been made use of in practical medicine.
of the bark (5 to 200) has been employed in doses of ʒj–ij according to
titute for Senega in the treatment of diseases of the respiratory organs
nt expectorant is indicated. Its expectorant properties are well estab-
dren take it readily. It does not provoke diarrhea or vomiting, and has
eable taste.

, **Resin,** *Colophony,* $C_{44}H_{62}O_4$,—is the residue left after
the volatile oil from Turpentine. It is a transparent, amber-
ance, hard and brittle, with a glossy and shallow conchoidal
a faintly terebinthinate odor and taste; soluble in alcohol,
or volatile oils, and in its own weight of oil of turpentine.
t is considered as the Anhydride of *Abietic Acid,* $C_{44}H_{64}O_5$,
cid it is converted by agitation with warm diluted alcohol.
, and *Palmaric Acids* are decomposition products, not con-
esin as was formerly taught.

nition of a Resin see *ante* page 25, also the title RESINÆ in Part II.
sins are Resina Copaibæ, Resina Jalapæ, Resina Podophylli and Resina
ich are severally described under the titles of the plants forming their
es.

Preparations.

esinæ, *Resin Cerate, Basilicon Ointment,*—consists of Resin 35, Yellow
ard 50 parts. It forms 65 per cent. of Turpentine Liniment.

n Resinæ, *Resin Plaster, Adhesive Plaster,* consists of Resin 14, Lead
low Wax 6 parts. Is the common adhesive plaster of surgery, and an
e official Arnica, Belladonna and Capsicum Plasters.

is an ingredient of Cantharides Cerate.

s consistence and adhesiveness to plasters and cerates, and
s as a mild local stimulant, but the writer has seen persons
ptible a skin that the ordinary adhesive plaster would pro-
a high degree of cutaneous irritation. It is never employed
ut in chronic bronchial catarrh the fumes from boiling resin
with considerable advantage. Resin Cerate is one of the
nly used applications to promote the healing of indolent
o blistered surfaces, burns, scalds and chilblains.

INUM, Resorcin, *Metadioxybenzol,* $C_6H_4(OH)_2$,—is a
nol, isomeric with *Pyrocatechin* and *Hydroquinone,* obtained
rtain resins with a caustic alkali, but best prepared by
sium benzol-disulphonate with caustic potassa, the salt
posed into potassium sulphite and resorcin. It crystallizes in
mbic prisms or plates of neutral reaction, odorless, and of
id taste, very soluble in water, also in alcohol, ether, etc.

Dose, gr. v–xv;—as an antipyretic ℨss–j not repeated for several hours, or gr. v every 2 hours.

PHYSIOLOGICAL ACTION.

Resorcin is closely allied to Carbolic Acid, but possesses an advantage over the latter in that it is odorless, more soluble and almost non-irritant. It is equally powerful as an antiseptic and antiferment, arresting decomposition and destroying low organisms. Injected beneath the integument in solution it produces very little irritation and never causes inflammation or abscess. Vesication results from its application to the mucous membrane. Internally a 30- to 60-grain dose causes a sense of heat, discomfort and oppression, followed by profuse perspiration and languor; if fever be present the temperature of the body is lowered several degrees but rises again after a rigor in from 2 to 4 hours. Larger doses (150 grains) have produced deafness, dizziness, salivation, confused vision, vertigo, unconsciousness, general clonic convulsions and tetanic rigidity of the muscles of the neck, with no decline of temperature in feverless subjects. Toxic doses (gr. xv to each 35 ozs. of weight) cause in animals trembling succeeded by epileptiform convulsions, which increase in severity and then decline; the respiration is quickened and enfeebled, the heart's action becomes rapid, weak, and irregular, and death results from paralysis of respiration, the drug paralyzing the motor tracts in the spinal cord but not affecting the general sensibility. It is eliminated chiefly by the urine which it colors a bluish-violet hue, and with great rapidity, about one hour serving for its excretion. The best test of its presence is the solution of the perchloride of iron, which produces with resorcin a dark-violet, almost black color.

Antagonists.

Atropine and other cardiac and respiratory stimulants, cerebral excitants, and age which raise the arterial tension, are physiologically antagonistic.

THERAPEUTICS.

Resorcin is employed as an antipyretic and antiseptic, being pref to carbolic acid for internal and subcutaneous use. A 3 per cent tion gives good results in stomach complaints, as gastralgia, catarrh, gastritis, gastric ulcer, gastric cancer and fermentative i tion. In ulcer of the stomach its analgesic property is so mark the stomach is enabled to tolerate food. It has given very great tion in the treatment of diarrhea of children; and it is highl mended by some observers in intermittent fevers and malaria' generally, while others have been much disappointed with its these affections. As an antipyretic it has been used in erysip peral fever, septicemia, and diphtheria, and in the latter disease it has been locally employed in crystals with decided benefit. As a local application to tuberculous and other ulcerations of the larynx, in diphtheria, tonsillitis, pharyngitis, chronic rhinitis, etc., strong even supersaturated solutions are employed with increasing satisfaction, being highly efficient and quite painless. Applied to the peri-laryngeal mucous membrane, it has proved very useful in the treatment and prophylaxis of pertussis. A 2 per cent. solution has given satisfaction as a local antiseptic application to wounds, parasitic skin diseases, cystitis, gonorrhea, anthrax, and syphilitic sores of unhealthy character. As a spray a similar solution is well applied to catarrhal or ulcerative affections of the respiratory passages. As a caustic it may be applied in undiluted form to chancres, papillomata and carbuncles. A saturated ethereal solution is a good application where the caustic action of the drug is required.

A paste consisting of equal parts of Resorcin and Zinc Oxide has been applied to the face to promote peeling of the skin in the treatment of acne rosacea. In three or four days the skin becomes like parchment, when the application must be stopped, in order to avoid the cracking of the skin which begins at that stage. A dressing of gelatin, glycerin, zinc oxide and hot water is then applied, covered with cotton wool. In a few more days the dressing comes off, bringing the epidermis with it. Some few dangerous and unfavorable results have followed this method, but a number of very satisfactory cases are reported. Freckles and other superficial spots on the skin may be removed by the same treatment.

RHAMNUS PURSHIANA, **Cascara Sagrada**, *Chittem Bark*, *Sacred Bark*,—is the bark of *Rhamnus Purshiana*, the California Buckthorn, a small tree of the nat. ord. Rhamneæ, growing on the Pacific Coast of the United States. It contains a *Volatile Oil*, a neutral crystalline substance, several *Resins*, with tannic, malic and oxalic acids. It has been found very serviceable in the treatment of chronic gout and chronic constipation, given in gradually diminished doses. It produces large, soft and painless evacuations, and the bowels are said to act naturally and regularly after its disuse.

Another species of the same order, *Rhamnus Frangula*, is official under the title FRANGULA, which see.

Extractum Rhamni Purshianæ Fluidum, *Fluid Extract of Cascara Sagrada*,—made with diluted alcohol. Dose, ʒss–jss, two or three times a day.

Cascara Cordial is a trade preparation, intended as a remedy for constipation, dyspepsia and hemorrhoids, and as a pleasant excipient for nauseous and bitter drugs. A similar preparation may be made by combining the fluid extract with the official Elixir Aromaticum in the proportion of ʒj to ℥ij, of which the dose is ʒj or more.

RHEUM, **Rhubarb**,—is the root of *Rheum officinale*, a perennial plant of the nat. ord. Polygonaceæ, a native of Thibet. There are many other undetermined species of *Rheum*, several of which are cultivated in Europe and America, their leaf-stalks being used as a fruit. The commonly accepted medicinal Rhubarb is the Chinese variety, and is imported from Shanghai and Canton. It imparts its virtues to water and alcohol, and contains several substances of greater or less activity, the least important being *Phæoretin*, the rhubarb-resin, *Erythroretin*, and *Chrysophan*, the latter of which is split by acids into sugar and chrysophanic acid. (See CHRYSAROBINUM.) It also contains *Rheo-tannic Acid*, $C_{52}H_{32}O_{28}$, *Rheumic Acid*, $C_{40}H_{32}O_{18}$, and probably a principle which is identical with Cathartic Acid (see SENNA), on which its purgative activity may depend. Dose of Rhubarb as a stomachic, gr. j–v; as a purgative, gr. x–xxx.

Preparations.

Extractum Rhei, *Extract of Rhubarb*.—Dose, gr. j–x.

Extractum Rhei Fluidum, *Fluid Extract of Rhubarb*.—Dose, ♏x–ʒj.

Pilulæ Rhei, *Pills of Rhubarb*,—are composed of Rhubarb 60, Soap 6, Water to 100; each pill containing about 3 grains of powdered Rhubarb. Dose, j–v pills.

Pilulæ Rhei Compositæ, *Compound Pills of Rhubarb*,—each pill contains of Rhubarb about 2 grains, Aloes 1½, Myrrh 1, Oil of Peppermint $\frac{1}{10}$ grain. Dose, ij–v pills.

Tinctura Rhei, *Tincture of Rhubarb*,—has of Rhubarb 10, Cardamom 2, Glycerin 10, Alcohol and Water to 100. Dose, ʒj–iv.

Tinctura Rhei Aromatica, *Aromatic Tincture of Rhubarb*,—has of Rhubarb 20, Cinnamon 4, Cloves 4, Nutmeg 2, Glycerin 10, Alcohol, Water and Diluted Alcohol to 100. Dose, ʒj–iv.

Tinctura Rhei Dulcis, *Sweet Tincture of Rhubarb*,—has of Rhubarb 10, Glycyrrhiza 4, Anise 4, Cardamom 1, Glycerin 10, Alcohol, Water and Diluted Alcohol to 100. Dose, ℥ss–ij.

Syrupus Rhei, *Syrup of Rhubarb*,—has of the Fluid Extract 10, Spirit of Cinnamon 0.4, Potassium Carbonate 1, Glycerin 5, Water 5, Syrup to 100. Dose, for an infant, ʒj; for older children, ʒij–iv.

Syrupus Rhei Aromaticus, *Aromatic Syrup of Rhubarb*,—has of the Aromatic Tincture 15, Syrup 85. Dose, as the Syrup.

Pulvis Rhei Compositus, *Compound Powder of Rhubarb*,—has of Rhubarb 25, Magnesia 65, Ginger 10. Dose, a teaspoonful.

Mistura Rhei et Sodæ, *Mixture of Rhubarb and Soda*,—has of Sodium Bicarb. 3½, Fluid Extract of Rhubarb 1½, Fluid Extract of Ipecac ⅓, Glycerin 35, Spirit of Peppermint 3½, Water to 100. Dose, ʒij–℥ij.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Rhubarb is classed among the tonic-astringent and resin-bearing purgatives, agents which increase the circulation of the glandular appendages of the intestinal canal and stimulate the muscular layer of the bowel. In small doses (gr. j–v) its action is that of a gastric tonic and an intestinal astringent, the influence of the bitter principle and the rheo-tannic acid probably predominating. In larger doses (gr. xxx–lx) its cathartic action prevails, producing in 6 to 8 hours copious yellow, pultaceous stools, with some griping and considerable hepatic stimulation. After the cathartic principle is expelled, the astringent quality of its tannin asserts itself and constipation is likely to result. The yellow color of the stools is partly due to the rhubarb pigment and partly to excess of bile, the drug having marked cholagogue properties, probably due to its resin, Phæoretin. Its pigment stains the milk, urine and sweat, the milk acquiring a bitter taste and purgative properties. The cathartic action of Rhubarb may be obtained from its application locally to ulcers, by being rubbed into the moist skin, or applied to the abdomen as a poultice.

Rhubarb is highly esteemed as a cathartic for children, from the mildness of its action; though occasionally producing quite severe griping, it never inflames the gastro-enteric mucous membrane. The tonic and astringent action following its catharsis makes it a valuable agent in diarrheas due to the presence of irritating matter in the bowel, and to correct atonic indigestion accompanied by diarrhea. For hemorrhoids with constipation its gentle action makes it peculiarly suitable, its astringent after-effect being entirely overcome by 2- to 4-drachm doses of olive oil nightly. It may be combined with a mercurial or with sodium bicarbonate, the latter being supposed to overcome its astringent action and to disguise its taste in some degree. In small doses the tincture is a very efficient stomachic tonic, improving appetite, increasing the flow of the gastric juice, assisting digestion, and promoting the action of the liver without producing any cathartic results. The preparations most in use for children are the Aromatic Syrup and the Mistura Rhei et Sodæ.

RHINACANTHUS (Unofficial),—the leaves and root of *Rhinacanthus communis*, a shrub of the nat. ord. Acanthaceæ, indigenous to India and China. The root contains a quinone-like body named *Rhinacanthin*, $C_{14}H_{18}O_4$, which forms with alkalies intensely red compounds which are decomposed by benzin. It is known in China as *Hong-Pang-Chong*, and is employed as a local remedy for ringworm and parasitic skin diseases, the leaves being bruised and mixed with lime-juice. Used internally a tincture of the root has some reputation as a feeble tonic and antiperiodic. The same preparation is applied locally in chronic eczema, tinea, and psoriasis.

RHUS AROMATICA, Sweet Sumach (Unofficial),—is an indigenous shrub of the nat. ord. Terebinthaceæ, growing about 5 feet high, and having yellow flowers in spikes. The root-bark contains a volatile oil, several resins, fat, tannin, etc. A fluid extract is prepared from the bark of the root according to the general pharmacopœial rule, and may be given in doses of ♏x–xxx, every 2 or 3 hours.

Rhus Aromatica has astringent properties, and seems to possess a selective action upon the urinary tract. Its action is not yet clearly made out. Therapeutically it has been used with advantage in cystitis, night-sweats, hematuria, menorrhagia, diabetes insipidus, diarrhea and dysentery. As a remedy for incontinence of urine in children it has attracted considerable attention, having been extremely efficient in doses of ♏xv of a good fluid extract four times daily, administered in glycerin and water, or any other suitable excipient. It is reported to be equally effective in hysterical enuresis of adults, but larger doses (♏xx–xxx several times a day) are required. Diabetes insipidus is remarkably benefited by its continued use, and even in diabetes mellitus its employment has occasionally seemed to have been followed by curative results.

RHUS GLABRA, Smooth Sumach,—is the fruit of *Rhus glabra*, an indigenous shrub of the nat. ord. *Anacardiaceæ*, growing in rocky and barren soil to a height of 8 to 12 feet. The leaves and bark have an astringent and bitter taste, and are also used medicinally. It contains tannin, coloring matter, also potassium and calcium malates.

Extractum Rhoïs Glabræ Fluidum, *Fluid Extract of Rhus Glabra*.—Dose, ʒj–ij.

Sumach-berries form a useful acidulous and astringent drink or gargle in catarrhal pharyngitis, stomatitis, aphthæ, etc. An infusion (℥j to the pint) or the official fluid extract may be used as a wash and dressing for ulcers and wounds. Internally they are useful remedies for mild catarrhal affections of the stomach and bowels.

RHUS TOXICODENDRON, Poison Ivy,—is the fresh leaves of *Rhus radicans*, a plant of the nat. ord. *Anacardiaceæ*, indigenous to Canada and the greater part of the eastern United States. This climbing plant is not by itself a distinct species, but a variety of the erect shrub, *Rhus Toxicodendron*, the Poison Oak, formerly official as a source of the drug; both of which when wounded exuding a poisonous, acrid, milky juice which turns dark on exposure. The poisonous principle of the plant is *Toxicodendric Acid*, which is volatile, and also exists in *Rhus venenata* or Swamp Sumach, *Rhus pumila*, and *Rhus diversiloba*, the first of which is probably the most poisonous of the four. The dose of the leaves is generally placed at gr. j–iv, but if old and dry they will generally prove to be inert. There are no official preparations.

Tinctura Rhoïs Toxicodendri, *Tincture of Rhus Toxicodendron* (Unofficial),—may be prepared according to the formula of the Pharmacopœia for Tincturæ Herbarum Recentium (Tinctures of Fresh Herbs), one part of the fresh leaves to two of Alcohol. Dose, ♏ $\frac{1}{10}$–♏ ij.

Extractum Rhoïs Toxicodendri, *Extract of Rhus Toxicodendron* (Unofficial),—has been used in France in large doses. It is probably inert.

PHYSIOLOGICAL ACTION.

The effects of Rhus Toxicodendron upon the skin are familiar to all who have suffered from contact with poison-oak or ivy. Some persons are so susceptible to this poison that the exhalations from the plant will produce on them its characteristic action. Others are apparently insusceptible to its influence, and can with impunity rub the juice into their skin, or even chew its leaves. The action of the plant when locally applied is that of a cutaneous irritant, causing redness and swelling of the affected parts, with a vesicular eruption and intolerable itching, which may spread rapidly over the surface of the body and extend to the mucous membranes, producing conjunctivitis, redness and tumefaction of the mouth and throat, thirst, cough, nausea and vomiting, vertigo and stupefaction. Colicky pains are experienced in the abdomen, are worse at night and are aggravated by food and drink. Diarrhea may occur, with tenesmus and bloody stools, also diuresis, bloody urine, or even complete retention. Fever with delirium is frequently present, and may be typhoid in character, or intermittent with profuse perspiration. Pains of rheumatoid type are experienced throughout the body, but particularly in the joints and lumbar region, apparently intensified by rest and heat. The fibrous structures are evidently the seat of its selective action, and a sensation of numbness in the lower extremities is frequently experienced. Similar phenomena attend its internal administration, but fatal results have not followed in any case of poisoning recorded. The effects of the poison usually last from ten to fifteen days, and are then followed by desquamation of the epidermis.

Antidotes and Antagonists.

Cocaine Hydrochlorate, in 4 to 8 per cent. solution, is the best lotion to relieve the intolerable itching and burning. *Grindelia Robusta* makes one of the best local applications, and a solution of *Mercuric Chloride* is also a very serviceable lotion; also *Lime-water* with Linseed-oil, solution of Plumbum Acetate, solution of Chlorinated Soda, and Alum-curd are all useful. Rest, low diet and laxatives are appropriate, and *Opium* or strong black coffee to relieve the irritability of the nervous system.

THERAPEUTICS.

Rhus Toxicodendron was used medicinally by Dufresnoy in France and by Alderson in England about the close of the eighteenth century. The attention of the former was attracted to it by the accidental poisoning of a student who was afflicted with chronic eczema, which disappeared on the subsidence of the Rhus symptoms. It is a favorite remedy with the so-called homeopathists, who ascribe to it extraordinary virtues in acute cutaneous affections of vesicular type, subacute and chronic rheumatism, vesicular erysipelas and typhoid fever. Among regular authorities it meets with very little favor as a remedial agent, but Phillips recommends it strongly in rheumatic affections of the fibrous tissues, erythema and erysipelas, eczema, herpes zoster and pemphigus. Piffard corroborates these opinions of its therapeutical value, and states that when rheumatic pain is worse at night prompt relief may be expected from Rhus. It was used by Dufresnoy in paralyses with some success, and Eberle reports a case of paralysis in which it proved curative. It is admitted by many observers to be a useful remedy in paralytic affections of the lower extremities depending on a rheumatic diathesis, or resulting from exposure to cold and wet. As an external application it is efficacious in sprains and other affections of ligaments and tendons, also to extensive but superficial burns, stings of insects and chilblains. For these affections a lotion of about ʒss of the tincture to a pint of water is usually employed.

RICINI OLEUM, Castor Oil,—is a fixed oil expressed from the seeds of *Ricinus communis*, a tree of the nat. ord. Euphorbiaceæ, indigenous to India, but extensively cultivated in the United States. The oil is an almost colorless, transparent, viscid liquid, of faint odor, bland or slightly acrid taste, neutral reaction, soluble in an equal weight of alcohol. It consists mainly of *Ricinolein* the glyceride of ricinoleic acid, also palmitin, stearin and myristin in small quantities, and an acrid principle. The seeds contain a highly toxic ferment or phytalbumose named *Ricin*, and an alkaloid, *Ricinine*, which seems to be inert.

Castor Oil is an ingredient of Collodium Flexile in the proportion of 3 per cent., also of Linimentum Sinapis Compositum, 15 per cent., and of Pilulæ Antimonii Compositæ.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Used externally pure Castor Oil is perfectly bland. Internally administered it is non-irritant until it reaches the duodenum, where it is decomposed by the pancreatic juice setting free the Ricinoleic Acid, which produces purgation by a mildly irritant action on the bowel, stimulating the intestinal glands and muscular coat, but not the liver. It is a simple purgative, acting in four to six hours, producing one or more liquid stools without pain or tenesmus, and followed by a sedative effect on the intestines. The leaves are believed to possess galactagogue properties when locally applied as a poultice to the breasts. Ricinoleic Acid enters the blood and the tissues, and is excreted with the various secretions of the body, imparting its purgative qualities to the milk of the nursing mother. Ricin, given either hypodermically or by the mouth, produces violent gastro-enteritis, nephritis and cystitis, also inflammation of the mucous lining of the biliary duct. To it is ascribed the jaundice and anuria observed in some cases of poisoning by castor-oil seeds.

Castor Oil is one of the best of the simple purgatives, and is used when a free evacuation of the bowels is alone indicated, or when only a laxative action is desired, as in the constipation of typhoid fever, in pregnancy and post-partum conditions, diarrhea from the presence of irritating matter in the bowels, and after operations on the abdominal or pelvic organs. It is often used as a purgative for children, also for the aged and infirm. Infants bear a larger relative dose than adults, probably from their ability to digest a greater quantity of what is taken. It is employed with great benefit as a laxative in irritation or inflammation of the bowels, in hemorrhoids, inflammatory or spasmodic affections of the genito-urinary organs, nephritis or cystitis, gonorrhea, calculi, and stricture of the urethra and rectum. In cases of dysentery 10 to 20 drops of laudanum may be added to each dose to counteract the pain, tenesmus and exhaustion resulting from the frequency of the passages. If much depression exists, as shown by lowered arterial tension and a dry, glazed tongue, 5 drops of oil of turpentine should also be added.

Castor Oil is much used in the puerperal state and greatly abused. There is considerable evidence in support of the charge that it induces hemorrhoids by congesting the rectal vessels. Its purgative action is milder in proportion to the purity of the sample employed. Externally, the pure oil is employed as a local sedative and protective, as in neutralizing the effects of lime upon the conjunctiva. The leaves of the castor-oil plant are used to promote the secretion of milk. They may be applied to the breast in poultice, and a decoction or fluid extract given internally at the same time.

Administration.

The nauseous smell is best concealed by the Essential Oil of Bitter Almonds. Emulsions are not a success. Capsules containing the requisite dose are easily obtained. In the absence of these the best way to administer a dose of oil is to smear the sides of a clean wineglass with very thick cream, then to pour in the oil, covering it with a little more cream. A teaspoonful of cream being then taken into the patient's mouth, he is directed to bolt the dose at one gulp. Some prefer it floated on orange-juice, strong coffee, gruel or wine. One of the best vehicles for it is foaming beer. Glycerin increases its purgative power, when given conjointly. If the mouth be chilled by broken ice immediately before taking the oil, the taste of the latter will be imperceptible.

ROSA, Rose,—is represented in pharmacy by the petals of two species and the volatile oil from a third.

Rosa Centifolia, *Pale Rose,*—is the petals of *Rosa centifolia,* the Cabbage Rose, a well-known cultivated shrub of the nat. order Rosaceæ. The odor is due to a minute quantity of a volatile oil, besides which the petals contain tannin, fat, resin, sugar, etc. If it is desired to keep Pale Rose fresh for any length of time, it should be mixed with one-half its weight of sodium chloride and pressed into a jar, which should be kept in a cool place, well closed.

Rosa Damascena, *Damask Rose,*—is the source of the official Oil of Rose, which is distilled from the fresh flowers. This variety of the nat. order Rosaceæ is largely cultivated in Roumelia, on the southern slope of the Balkan mountains, from which section comes nearly all of the oil supplied to commerce.

Rosa Gallica, *Red Rose,*—is the petals of *Rosa gallica,* collected before expanding. They contain an aromatic oil, tannic and gallic acids, *Quercitrin,* coloring matter, salts, etc.

Preparations of Rosa Damascena.

Oleum Rosæ, *Oil of Rose, Attar of Rose,*—is a volatile oil distilled from the fresh flowers of *Rosa damascena.* It is a pale-yellowish, transparent liquid, having a strong odor of rose, a sweetish taste and a slightly acid reaction, but slightly soluble in alcohol. It consists of an aromatic oxygenated elæopten and an odorless solid stearopten (rose-camphor). Being very expensive it is much adulterated with other volatile oils. It is used chiefly for perfuming cosmetic preparations, ointments and lotions, and as the basis of the following:

Aqua Rosæ Fortior, *Stronger Rose Water, Triple Rose Water,*—is water saturated with the volatile oil of Rose petals, obtained as a by-product in the distillation of Oil of Rose. An agreeable excipient and flavoring agent. Dose, ℥ ss–j.

Aqua Rosæ, *Rose Water,*—consists of equal volumes of the preceding and distilled water, mixed together immediately before use. It is an ingredient of Mistura Ferri Composita. Dose, ℥ j–ij.

Unguentum Aquæ Rosæ, *Ointment of Rose Water, Cold Cream,*—has of Stronger Rose Water 19, Expressed Oil of Almond 60, Spermaceti 12½, White Wax 12, and Sodium Borate ½. For local use.

Preparations of Rosa Gallica.

Extractum Rosæ Fluidum, *Fluid Extract of Rose,*—prepared with glycerin and diluted alcohol. Dose, ♏v–ʒj.

Confectio Rosæ, *Confection of Rose,*—has of Red Rose 8, Sugar 64, Honey 12, Stronger Rose Water 16, beaten together into a mass. Dose, gr. x–ʒj.

Mel Rosæ, *Honey of Rose,*—has of the Fluid Extract 12, and Clarified Honey to 100. Dose, ʒj–ij.

Syrupus Rosæ, *Syrup of Rose,*—has of the Fluid Extract 12½, with Syrup 87½. Dose, ʒj–ij, for flavoring.

Red Rose is an ingredient of Pil. Aloes et Mastiches.

Pale Rose petals are used only for odoriferous purposes. Rose Water has no strictly medicinal properties, but is an agreeable excipient for lotions, collyria and urethral injections. The ointment, commonly termed *cold cream,* is a pleasant emollient and protective agent, generally used for chapped hands and other superficial skin affections. Red Rose is classed among the astringents, as it contains an appreciable amount of tannic and gallic acids. A compound infusion, containing sugar and dilute sulphuric acid, was formerly official, and is used as an agreeable gargle for the throat and mouth in inflamed and ulcerated conditions. The chief uses of the rose preparations are as vehicles for other agents, or to impart flavor and odor to extemporaneous prescriptions.

ROSMARINUS, Rosemary,—the source of the official Oil of Rosemary, is the leaves of *Rosmarinus officinalis,* a shrub of the nat. ord. Labiatæ, cultivated for the sake of its large, pale-blue flowers. They are pungently aromatic and somewhat camphoraceous, and contain the volatile oil, a little tannin, some resin and a bitter principle.

Oleum Rosmarini, *Oil of Rosemary,*—is the volatile oil distilled from Rosemary, a colorless or yellowish liquid, having the characteristic odor of the plant and a camphoraceous taste; readily soluble in alcohol. It consists of a terpene, isomeric with Turpentine, $C_{10}H_{16}$, and a body allied to camphor. It is an ingredient of Linim. Saponis, Spiritus Odoratus and Tinct. Lavandulæ Comp. Dose, ♏j–v.

Rosemary was formerly considered emmenagogue, galactagogue and diuretic, but is now never employed in substance. Its oil is somewhat stimulant and carminative, and in excessive quantity has caused death. It is chiefly used as an external stimulant in liniments and lotions, especially to the scalp in alopecia, where it is supposed to increase the blood-supply to the hair bulbs and is usually combined with cantharides. Inhaled it reduces the body-temperature and gives the urine a violaceous odor.

RUBIDIUM, Rubidium, Rb, (Unofficial),—is one of the rarer metals, belonging to the group of alkaline metals of which potassium and sodium are typical. It has a molecular weight of 85, that of Potassium being 39, and that of Sodium 23. Its salts are supposed to act more promptly and efficiently than those of the latter, upon the theory that the physiological action of salts is as much a periodic function of the atomic weights of their elements as are their physical and chemical characteristics. Its principal salt is—

Rubidii Iodidum, *Rubidium Iodide,* Rb I, (Unofficial),—occurs in white, non-efflorescent crystals, odorless, of milder taste and greater solubility in water than Potassium Iodide. Dose, gr. v–xxx or more.

Rubidium Iodide has generally the same physiological and therapeutical action as Potassium Iodide, but has a far less toxic action upon the cardiac muscle. It is well borne by the stomach, does not disturb the appetite or give rise to digestive derangements, and does not affect the circulation. It rarely produces iodism, and even when the iododerma and catarrh were present as the result of the administration of potassium iodide, the change to the rubidium salt has resulted in decrease of these symptoms. It has been employed in lieu of the potassium salt, with greater efficiency and less disturbance, in most of the affections for which the iodides are indicated. In eye affections requiring an absorptive treatment it is employed internally and externally as a 5 per cent. vaseline ointment or in the form of 5 per cent. drops (ʒj to ℥ijss).

RUBUS, Blackberry-Bark,—is the bark of the root of *Rubus villosus* the common Blackberry, *Rubus canadensis* the Dewberry, and *Rubus trivialis* the Bush Blackberry of the Southern States, all of the nat. ord. Rosaceæ. It contains over 10 per cent. of tannin. Dose, gr. xv–xxx.

Extractum Rubi Fluidum, *Fluid Extract of Rubus.*—Dose, ♏x–ʒj.

Syrupus Rubi, *Syrup of Rubus,*—has of the Fl. Extr. 25, Syrup 75. Dose, ʒj–℥j.

Syrupus Rubi Aromaticus, *Aromatic Syrup of Rubus* (Unofficial),—contains Rubus, Cinnamon, Cloves and Mace. Each fl℥ has 30 grains of the drug. Dose, ʒj–℥j.

Blackberry-bark derives its virtues from its tannin. It is strongly astringent, and may be used in decoction, wine or the above-named preparations. It is highly esteemed in summer and infantile diarrheas.

RUBUS IDÆUS, Raspberry,—is the fruit of *Rubus idæus* the Raspberry bush, nat. ord. Rosaceæ. It contains sugar, malic and citric acids, proteids, pectin, etc., also a *Volatile Oil* consisting of compound ethers, to which the odor is due. Its sole use in medicine is to prepare a pleasantly flavored syrup. The closely allied, light-red fruit of *Rubus strigosus* the wild Red Raspberry, and the purplish-black fruit of *Rubus occidentalis* the Thimble-berry, may be employed in place of the raspberry.

Syrupus Rubi Idæi, *Raspberry Syrup,*—has of Raspberries and Sugar any convenient quantity, boiled (but not in tinned vessels) and strained. Dose, ad libitum. It has a bright-red color, a fruity, agreeable odor, a pleasant, acidulous taste and an acid reaction. It has no special medicinal virtues, but forms an agreeable flavoring for mixtures, and mixed with water a pleasant drink in febrile conditions.

The leaves of the wild Red Raspberry (*Rubus strigosus*) are considerably astringent, and in infusion, ℥j to the pint, are a popular domestic remedy for diarrheas.

RUMEX, Yellow Dock,—is the root of *Rumex crispus*, and of some other species of Rumex, plants of the nat. ord. Polygonaceæ, growing as common weeds along roadsides. Several species of Rumex have sour leaves, and are popularly called *Sorrel* to distinguish them from the others which are called *Dock*. The official root contains tannin, mucilage, starch, calcium oxalate, and two principles named *Rumicin* and *Lapathin*, which are shown to be identical with *Chrysophanic Acid*. Its constituents are nearly identical with those of Rhubarb. Dose, gr. xv–ʒj.

Extractum Rumicis Fluidum, *Fluid Extract of Rumex.*—Dose, ♏xv–ʒj.

Decoctum Rumicis, *Decoction of Rumex* (Unofficial),—℥ij of the fresh root of ℥j of the dry root to Oj of water. Dose, ℥j–ij.

Rumex is astringent, tonic and laxative. It has also been considered alterative and anti-scorbutic. It is employed in chronic cutaneous disorders, glandular swellings, and other symptoms of the strumous diathesis. It seems to possess a selective action on the mucous membrane of the larynx, and in many cases of laryngeal irritation with catarrhal symptoms, dry, violent cough, and a sense of soreness behind the sternum, it will give relief. The Rumex Acetosa has a popular reputation as a local application for cancer.

RUTA, Rue (Unofficial),—the leaves of *Ruta graveolens*, an herbaceous perennial of the nat. ord. Rutaceæ, growing wild throughout Southern Europe, and frequently cultivated in gardens for its yellowish flowers. The fresh leaves only should be used, and as drying impairs their qualities the oil is generally employed in medicine.

Oleum Rutæ, *Oil of Rue* (Unofficial),—the volatile oil distilled from *Ruta graveolens*; a colorless, or greenish-yellow liquid, of disagreeable but aromatic odor, pungent acrid taste and neutral reaction, soluble in an equal weight of alcohol. Dose, ♏j–v.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Rue is an active irritant, the oil applied locally producing heat, inflammation and vesication. Administered in full medicinal dose it causes a sensation of heat in the stomach and skin, increases the action of the heart, and stimulates the bronchial, cutaneous and renal secretions. The odor of the oil is distinctly perceptible in the breath, sweat and urine. After a toxic dose of the oil violent gastro-enteritis results, with extreme prostration, convulsions, strangury and suppression of the urine, and the symptoms of a narcotic poison ensue if the dose is large enough. Abortion may be produced by large doses, but with great danger to life. Rue is an efficient emmenagogue, and in men aphrodisiac; it is also considered antispasmodic and carminative.

The Oil of Rue is employed internally in amenorrhea, menorrhagia, and metrorrhagia, hysteria, convulsions and flatulence. As an emmenagogue it is very efficient when the condition is one of functional inactivity of the uterus and ovaries. In small doses it has been well used in metrorrhagia from debility and after abortion. A decoction of the fresh leaves is often employed by injection against thread-worms, and internally to remove lumbricoid worms. Externally the same preparation has been applied to the chest in chronic bronchitis, also in various scaly eruptions and glandular enlargements. Used as an abortifacient it has frequently caused death, preceded by symptoms of irritant and narcotic poisoning. Even in poisonous doses its abortifacient action is very uncertain, so that only the most ignorant criminals employ it with such purpose. It was formerly official but has been dismissed from the pharmacopœia.

SABINA, Savine,—the tops of *Juniperus Sabina*, a small evergreen shrub of the nat. ord. Coniferæ, growing in Northern Europe, Asia and America. It closely resembles Red Cedar (*Juniperus virginiana*), but is distinguished from the latter by its smaller size and by its larger fruit. It contains a Volatile Oil (which is official), also tannin, resin, extractive matters, chlorophyll, etc. Dose, gr. v–x.

Preparations.

Extractum Sabinæ Fluidum, *Fluid Extract of Savine.*—Dose, ♏v–xv.

Ceratum Sabinæ, *Savine Cerate* (Unofficial),—may be prepared by incorporating the Fluid Extract 25 in Resin Cerate 90, melted and cooled. Formerly official.

Oleum Sabinæ, *Oil of Savine,*—a volatile oil distilled from Savine, existing in the fresh tops in the proportion of 2½ per cent., and in the berries 10 per cent. It is a colorless or yellowish liquid, isomeric with oil of turpentine, $C_{10}H_{16}$, having a peculiar, terebinthinate odor, a pungent camphoraceous taste and neutral reaction; soluble in an equal volume of alcohol. Dose, ♏j–v.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Externally the action of Savine resembles that of Turpentine, except that it is more irritant, the oil producing vesication if applied sufficiently long. Internally a full medicinal dose causes heat sensations, nauseous [illegible] flatulence, increased cardiac action, stimulation of the circulaneous, bronchial and renal secretions, irritation of the kidneys, hyperemia of the ovaries and uterus and increased menstrual activity. In large doses it produces hematuria, dysuria, and intense gastro-enteritis, with violent vomiting and purging. Toxic doses produce the symptoms of an irritant and narcotic poison. It may originate uterine contractions in the pregnant female, but its abortifacient effect can only be produced by a quantity sufficient to endanger life. The oil diffuses into the blood and is excreted by the various excretory channels.

As an emmenagogue Savine is highly esteemed by many authorities, Phillips considering it "one of the most certain and powerful" agents of this class, "with the additional advantage that it can be given with perfect freedom from risk of doing harm." So irritant an agent, however, requires the exercise of great caution in its use. It has been found extremely efficient in dysmenorrhea when not due to mechanical causes; also in menorrhagia and hemorrhage after abortion. In chronic gout and the joint affections of chronic rheumatism, it was formerly much employed. Externally the Cerate is used to prolong the discharge from blisters, setons or issues, and to stimulate the healing of indolent ulcers. For these purposes it is considered safer than cantharides, as its prolonged employment does not bring on strangury or vesical irritation. As a caustic it is efficient for the destruction of warts and other excrescences, and the moistened powder is used as a paste on venereal condylomata, in combination with burnt alum or cupric subacetate. The Oil is the most efficient preparation for internal administration.

SACCHARINUM, Saccharin (Unofficial),—is a sweet imide derivable from a coal-tar product, *Toluene*, from which it is prepared by a complicated process. It has the chemical title *Benzoyl-sulphonic-imide*, and the formula $C_6H_4(CO)(SO_2)NH$. It occurs as a white, amorphous powder, with a very sweet taste, a faint flavor of bitter almonds, and is official in the Br. Phar. under the title GLUSIDUM, *Gluside* (Glucusimide). The pure product is a white, crystalline powder, about 500 times sweeter than sugar and giving a distinct flavor to 70,000 times its weight of water, but the commercial article is standardized to about 300 times the sweetening power of sugar. Dose, gr. ss–ij.

Saccharin is soluble in 400 of water, 28 of boiling water, 30 of alcohol, 48 of glycerin, 500 of chloroform and in 100 of ether. [Sugar is *not* soluble in ether.] It is very soluble in a dilute solution of ammonia, also in solution of sodium bicarbonate where it acts the part of an acid, displacing CO_2.

Preparations.

Saccharinum Solubile, *Soluble Saccharin* (Unofficial),—is prepared by neutralizing a solution of sodium bicarbonate with saccharin. It is a soluble sodium saccharinate, containing about 90 per cent. of Saccharin, and is soluble in 15 of water.

Elixir Saccharini, *Elixir of Saccharin* (Unofficial),—has of Saccharin ℥j, Sodium Bicarbonate ℥ss, Alcohol ℥ijss, Distilled Water to ℥xx. Each drachm contains gr iij of Saccharin.

Saccharin is from 300 to 500 times sweeter than sugar and is also an efficient antiseptic. It is not a food and has no injurious action on man. It is eliminated in the urine and the saliva without change. It is used as a substitute for sugar in the food of diabetics and subjects of hepatic disease and corpulence; also to cover the taste of nauseous drugs and as an internal antiseptic in cases of cystitis with decomposing urine. A grain of Saccharin sweetens 6 to 8 fluidounces of liquid. It may be used to a maximum quantity of 30 grains per diem. It is rendered soluble by mixing with it two-thirds its quantity of sodium bicarbonate.

Dulcin, *Sucrol, Para-phenetol-carbamide* (Unofficial),—is a urea derivative of phenetidin and occurs in colorless crystals which are soluble in 800 of water, 55 of boiling water, 25 of alcohol, also in ether. Its sweetening power is about 200 times that of sugar. In reasonable doses it is harmless, does not cause any decomposition of the blood, or give rise to the great disgust engendered by Saccharin on prolonged use. Its great insolubility is its chief disadvantage. Dose, gr. ss–ij, up to a daily maximum of 30 grains.

Saxin,—is a similar product of English manufacture, said to be 600 times sweeter than sugar.

SACCHARUM, Sugar, *Cane sugar,* $C_{12}H_{22}O_{11}$,—is the refined sugar obtained from *Saccharum officinarum*, the Sugar-cane, a perennial plant of the nat. order Gramineæ, indigenous to India and adjoining countries but cultivated in tropical regions throughout the world. It is also obtained from various species or varieties of *Sorghum* (nat. order Gramineæ), and from one or more varieties of *Beta vulgaris*, the Sugar-beet (nat. ord. Chenopodiaceæ). It is present in several other grasses, as *Zea Mays*, Maize, also in the juice of various trees (maple, birch, palm, etc.), and in many roots.

Cane-sugar occurs in white, dry, hard crystalline granules, permanent in the air, odorless, of purely sweet taste and neutral reaction, soluble in 0.5 of water and in 175 of alcohol, in 0.2 of boiling water and in 28 of boiling alcohol, insoluble in ether. The saturated aqueous solution has the sp. gr. 1.345, and is miscible with alcohol in all proportions. Its freedom from Grape-sugar (glucose) and from more than a slight quantity of Inverted Sugar (glucose *plus* levulose) is ascertained by dissolving 1 gramme in 10 cc. of boiling water, then mixing with the solution 4 or 5 drops of test-solution of Silver Nitrate and about 2 cc. of Aqua Ammonia, and quickly heating to boiling, wher[illegible] not more than a slight coloration, but no black precipitate, should appear after standing at rest for 5 minutes.

Other Sugars.

Saccharum Lactis, *Sugar of Milk, Lactose,* $C_{12}H_{22}O_{11} + H_2O$,—see next page.

Glucose, *Dextrose, Grape-sugar, Starch-sugar,* $C_6H_{12}O_6$ (Unofficial), also known as liver-sugar, diabetic sugar,—forms yellowish nodules or crystals, very soluble in water and in alcohol, has a sweet taste less marked than that of cane-sugar, may be obtained artificially from cane-sugar or from starch, by boiling with a dilute mineral acid, or by the action of diastase, a vegetable ferment formed during the germination of grain. Boiling solutions of the alkalies convert it into a brown substance (melassic acid).

Levulose, *Fruit-sugar*, $C_6H_{12}O_6$ (Unofficial),—frequently found with grape-sugar in fruits, also in honey. See also *Diabetin*, below.

Inosit, *Phaseo-mannit*, $C_6H_{12}O_6 + 2H_2O$ (Unofficial),—exists in the juice of some meats, in asparagus, etc. Is very sweet, but does not undergo alcoholic fermentation.

Allied Substances.

Theriaca, *Treacle*, *Sugar-house Molasses* (Unofficial),—is the uncrystallizable residue of the process for refining sugar, a thick, brown, fermentable syrup, very sweet and of sp. gr. about 1.40. It is official in the Br. Ph., and is used in making up some of the official pills of that pharmacopœia.

Amylum, *Starch*, $C_6H_{10}O_5$,—when boiled with dilute mineral acids or when subjected to the action of diastase, ptyalin, or pancreatin, it is converted into glucose. (See *ante*, article AMYLUM.)

Preparations.

Sugar is an ingredient of Pil. Ferri Carbonatis, Pil. Ferri Iodidi, Ferri Carbonas Saccharatus, Mistura Ferri Composita, Pulvis Cretæ Compositus, Pulvis Glycyrrhizæ Compositus, also the Troches, Syrups, Compound Syrups, etc.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Sugar is employed in pharmacy and therapeutics chiefly as a vehicle, a corrigent, a preservative and an antiseptic. Syrups protect the active ingredients against putrefaction, but not always against fermentation. They also protect certain ferruginous preparations against oxidation. As an ingredient in troches, powders and extemporaneous mixtures sugar is used to cover the taste or to make insoluble substances more easily miscible with water. It increases the solubility of Lime in water. As a food it possesses well-known properties, being a nutrient to adipose tissue and a respiratory fuel, and is decidedly diuretic in its action upon healthy kidneys. Sugar and sugar-forming food constitute more than one-half of the nourishment needed by a healthy person, and when withheld or diverted as in diabetes, the patient is actually starved and undergoes progressive and rapid emaciation. Levulose is found to be more easily consumed in the system than cane-sugar, and in the treatment of diabetic patients may be used with benefit for some time. Heretofore its cost has been very great, but it is now being manufactured in large quantities and sold at a reasonable price, under the trade-name *Diabetin*.

SACCHARUM LACTIS, Sugar of Milk, *Lactose*, $C_{12}H_{22}O_{11} + H_2O$,—is one of the constituents of the milk of mammals, and is officially described as a peculiar crystalline sugar obtained from the whey of cow's milk by evaporation and purified by re-crystallization. Occurs in white, hard, crystalline masses, yielding a gritty, white powder, odorless, permanent in the air, of faintly sweet taste and neutral reaction, soluble in about 6 of water and in 1 of boiling water, insoluble in alcohol, ether or chloroform. On adding to a solution of sugar of milk in an equal weight of boiling water some solution of soda, the liquid turns brownish, and on further addition of test-solution of cupric sulphate a brick-red precipitate separates.

Sugar of Milk is the least soluble of all sugars in water and is soluble in alcohol. It enters into alcoholic fermentation with difficulty. In the presence of decomposing albuminous matter and under certain other influences, it undergoes the *lactic fermentation*, which results in the formation of Lactic Acid, Carbon Dioxide and Alcohol. It readily reacts with the reduction tests.

Lactose has been shown to act as a powerful diuretic, especially in cardiac dropsy, in which Sée considers it "the best and most certain diuretic we possess, the excretion of urine caused by it being greater than that due to any other drug." He found that it acts similarly to Caffeine though more powerfully, while possessing none of the disadvantages of the latter. Its diuretic action is but very slight in cases where extensive renal disease exists, and it has no power over dyspnea.

Sugar of Milk is used in the triturations, also in Dover's powder, deodorized opium, etc., as a diluent. Being much harder than cane-sugar it is considered a valuable excipient for powders requiring the minute subdivision of their medicinal constituent. It is less sweet than cane-sugar, and being less apt to ferment in the stomach and bowels is better than the latter for use with infants' food.

SALICINUM, Salicin, $C_{13}H_{18}O_7$,—is a glucoside obtained from several species of *Salix*, the Willow, and *Populus*, the Poplar, trees of the nat. ord. Salicaceæ. It is found also in *Gaultheria procumbens*, the Wintergreen (nat. ord. Ericaceæ), and in *Betula lenta*, the Sweet Birch (nat. ord. Betulaceæ), the volatile oils of which, distilled from the leaves of the former and from the bark of the latter, consist almost entirely of methyl salicylate (see next page).

Salix Nigra, the *Pussy Willow*, grows along streams in the Southern States. A fluid extract is on the market, and may be used in doses of ʒss thrice daily, as a sexual sedative.

Salicin occurs in colorless or white and silky, shining crystalline needles, or a crystalline powder, odorless, of very bitter taste, permanent in the air, of neutral reaction; soluble in 28 of water and in 30 of alcohol, in 0.7 of boiling water and in 2 of boiling alcohol; almost insoluble in ether or chloroform. Dose, gr. x–ʒj.

Acidum Salicylicum, *Salicylic Acid*, $HC_7H_5O_3$,—is an organic acid, existing naturally in combination in various plants, but most largely prepared synthetically from carbolic acid. It occurs in light, fine, white, prismatic needles, or a crystalline powder, odorless, of sweetish, afterwards acrid taste and acid reaction, permanent in the air; soluble in about 450 of water, but readily soluble in water containing 8 per cent. of Borax or 10 per cent. of Sodium Phosphate. It is soluble in 2½ of alcohol, in 14 of boiling water, in 2 of ether, in 80 of chloroform, and is very soluble in boiling alcohol. Dose, gr. v–ʒj.

Salicylic Acid is a derivative of Salicin, probably by double oxidation; but may also be considered as a substitution-derivative of Benzene, formed by replacing 2 atoms of its hydrogen, the one by hydroxyl, and the other by carboxyl. It is obtained therefore either synthetically by combining the elements of Carbolic Acid with those of Carbonic Acid, and subsequent purification,—or from natural Salicylates as the Oil of Wintergreen and Sweet-Birch,—or from Salicin, by heating with caustic potash and treating with hydrochloric acid. The acid prepared from natural sources is purer and more efficient than that prepared artificially, and will often be tolerated by a patient who cannot bear the latter.

Official Preparations.

Salol, *Salol, Phenyl Salicylate*, $C_6H_5C_7H_5O_3$,—is the salicylic ether of phenol, now obtained from salicylic acid by heating at from 320° to 464° F. excluding the air; by which process the acid is converted into Salol, Water and CO_2. It is a white, crystalline powder, odorless and almost tasteless, nearly insoluble in water, soluble in 10 of alcohol, and very soluble in ether, chloroform and oils. On being warmed with an alkali it splits up into Salicylic Acid 60, and Carbolic Acid 40. Dose, gr. v–xv, frequently repeated, in compressed tablets or in cachets, or suspended by mucilage of acacia or of tragacanth.

Lithii Salicylas, *Lithium Salicylate*, $LiC_7H_5O_3$,—a white or grayish-white powder, odorless, sweetish, deliquescent, very soluble in water and in alcohol. Dose, gr. v–ʒj.

Sodii Salicylas, *Sodium Salicylate*, $NaC_7H_5O_3$,—a white, amorphous powder, soluble in ¾ of water and in 6 of alcohol, also in glycerin. Dose, gr. v–ʒj.

Physostigminæ Salicylas, *Physostigmine* (*Eserine*) *Salicylate*,—is described under PHYSOSTIGMA. Dose, gr. $\frac{1}{100}$–$\frac{1}{60}$.

Methyl Salicylas, *Methyl Salicylate*; *Artificial* (*Synthetic*) *Oil of Wintergreen*, CH_3-$C_7H_5O_3$,—is a colorless liquid, having the characteristic odor and taste of Oil of Gaultheria, with the essential constituent of which it is identical. It is wholly identical with Oleum Betulæ Volatile, and is soluble in all proportions in alcohol, carbon disulphide, or glacial acetic acid. Dose, ♏v–xv, suspended in water or in sugared water.

Oleum Betulæ Volatile, *Volatile Oil of Betula*, *Oil of Sweet Birch*,—is a volatile oil distilled from the bark of *Betula lenta*, the Sweet Birch. It is identical with Methyl Salicylate (see above), and nearly identical with Oil of Gaultheria. Russia leather derives its odor from this oil. Dose, ♏v–xv.

Oleum Gaultheriæ, *Oil of Gaultheria*, *Oil of Wintergreen*,—consists almost entirely of Methyl Salicylate, and is nearly identical with the preceding. It is described under the title GAULTHERIA.

Unofficial Preparations.

Salophen, *Para-amidophenol Salicylate*,—contains the equivalent of nearly 51 per cent. of Salicylic Acid, and occurs as minute, white, crystalline scales, odorless and tasteless, insoluble in water, soluble in alcohol; decomposed by alkalies into salicylic acid and acetyl-para-amidophenol; also decomposed by the organisms as demonstrated in the urine. Dose, gr. v–xv, up to ʒj or jss in the 24 hours.

Salipyrin, *Antipyrin Salicylate*, $C_{18}H_{18}N_2O_4$,—is produced by the combination of Salicylic Acid 57.7, and Antipyrin 42.3 parts. It is a white, crystalline, odorless powder, very soluble in alcohol, insoluble in water. Its claims to preference are based upon its comparative harmlessness (ʒijss having been taken within 3 or 4 hours without the slightest ill effect); also its freedom from unpleasant after-effects. Dose, gr. x–xxx every hour or 2 hours until ʒij have been taken. It is best administered in wafers, as a powder, or in mixture, rubbed up with glycerin and flavored with raspberry syrup.

Malakin, *Salicyl-para-phenetidin*,—is a condensation product of salicylic aldehyde and p-phenetidin, occurring in bright yellow needles, almost insoluble in water or alcohol, and decomposed by dilute mineral acids. Its action is that of salicylic acid, but its effects are very mild,—hence its name (from *malakos*, mild). It has proved valuable in acute rheumatism and other febrile affections, as an antipyretic and analgesic. As it may be given for a long time without causing any disturbance, it is of especial service in habitual headache. Dose, gr. viij–xv, repeated about six times in 24 hours.

PHYSIOLOGICAL ACTION.

Willow-bark is highly astringent, antiperiodic and feebly tonic, but is never employed medicinally owing to its bulk. Salicin is a bitter tonic, also antifermentive, antiseptic and highly destructive to low organisms. It has slight antiperiodic power and is feebly antipyretic. It prevents the reaction between amygdalin and emulsin, also that of ptyalin, etc., on starch. It seems to be devoid of toxic power on man, and is mainly excreted as salicylic, salicyluric and salicylous acids, being first changed in the bowel into saligenin and glucose. Salicin is well borne by the stomach.

Salicylic Acid has properties similar to Salicin, but it is much more energetic in its action, being a powerful antipyretic and antiseptic. It is also anhydrotic, checking local perspiration when locally applied. Inhaled it causes irritation of the respiratory passages, producing sneezing and cough. In small doses it stimulates the stomach, heart and respiration, but moderate quantities derange the stomach, causing nausea and vomiting; while large doses depress the heart's action and the respiration after a primary excitation of both, lower the arterial tension, relax the vessels, produce free perspiration, and reduce the temperature in fever. It causes vertigo, dilated pupils, tinnitus aurium, a sensation of tension in the frontal cerebrum, delirium, and may produce bed-sores from depression of the circulation, but does not affect the peripheral nerves as to either motion or sensation. In the blood it is first changed to sodium salicylate, but a portion is again set free and uniting with glycocoll forms salicyluric acid, coloring the urine green. It is slowly excreted with the secretions generally, especially in the urine, sweat, saliva, and bile. It stimulates the kidneys, at the same time disinfecting them and increasing the acidity of the urine, but may so irritate the kidneys as to produce albuminuria and hematuria.

Salicylic acid is destructive to the torula and prevents alcoholic fermentation, also that caused by the organic ferments (pepsin, ptyalin, etc.). In solutions containing bacteria it will prevent their development if in the proportion of 1 per cent., and in that of 1 in 60 it will destroy them.

Sodium Salicylate is remarkably antipyretic in doses of gr. xv, given 4 or 5 times in 24 hours. It is a powerful diaphoretic, and an efficient cholagogue, and is supposed to possess the curious property of increasing the fluidity of the bile, at the same time that it promotes its secretion,—other cholagogues increasing the proportion of solids therein. (Brunton.) It has no antiseptic power, unless in association with a strong mineral acid which will liberate the salicylic acid.

Salol is antiseptic, antipyretic, and germicide, in a higher degree than either of its constituents. As an antipyretic in fever it stands next after antipyrin, and it acts with force sufficient to depress the temperature a degree or two below normal. It is sedative to the cerebrospinal system and somewhat analgesic. It causes profuse sweating, and in a few cases depression has accompanied its antipyretic employment, but it is not toxic, and may be used freely in its proper dosage, which ranges from 5 to 60 grains, up to 2 or 3 drachms in the 24 hours. In large doses it is liable to induce the symptoms of carbolic acid poisoning.

THERAPEUTICS.

Salicin and its derivatives are chiefly used in acute rheumatism, to lower temperature, relieve pain, and reduce articular swelling. They are most suitable to strong, vigorous patients, and if not promptly efficient they should be abandoned. The acid is much used as an antipyretic in fevers, especially those of septicemic character. It is a useful local application in gangrenous wounds, eczema of the hands or feet, cancer, burns, and in fetid perspirations, in the last affection being used in solution with borax.

Sodium Salicylate is more soluble than the acid and less irritant to the stomach, while in doses about 50 per cent. larger it is equally efficient. It is employed in 3- to 5-grain doses internally after meals, to arrest gastric fermentation and to prevent acidity and flatulence. It is used instead of the acid in acute and chronic rheumatism, to relieve headaches, and for phlegmasia alba, in which it is considered very efficient. It is considered an effective remedy to cut short an attack of tonsillitis, a "bad cold" and other acute affections of the respiratory mucous membrane, also in urticaria, diabetes, gout and cases having a tendency to the formation of gall-stones it has many advocates. Lithium Salicylate is not irritant and is supposed to act towards uric acid in the same manner as the other salts of this metal. It is said to be of especial value in acute rheumatism and rheumatic gout.

Salol is one of the most efficient remedies for duodenal catarrh, catarrh of the bile-ducts and catarrhal jaundice; also in the bilious form of sick-headache, and in some forms of neuralgia. Its therapeutic value depends chiefly upon its property of splitting up in the alkaline fluids of the inestine into Salicylic Acid and Phenol compounds, whereby it effects the horough antisepsis of the intestinal tract and performs the work of its constituent elements upon the organism. In all affections associated with micro-organisms in the intestines, as acute diarrhea, cholera, dysentery, etc., it has done most excellent service, even in Asiatic cholera. It is highly praised in epidemic influenza (grippe), having proved itself remarkably efficient in recent epidemics of that affection.

Salol is a remedy of very great value in typhoid fever; disinfecting the ulcerated intestine it promotes the healing process therein, and hinders reinfection. It is highly recommended in dysentery, in cholera, and in infantile diarrhea. Given in the latter affection, a dark staining of the child's diapers is often noticed, which is due to the development of carbolic acid from the remedy. Its greatest power is manifested over acute rheumatism, in which disease many clinicians maintain that it has no superior, if given in 15- to 30-grain doses, up to 2 drachms in the 24 hours, and continued for some time after the acute symptoms have subsided. In large doses, however, it is liable to induce symptoms of carbolic acid poisoning, which may be met by administering sodium sulphate or any other sulphate. It proves to be an efficient disinfectant in catarrh of the bladder, its constituents being excreted with the urine, and coming in contact with the vesical mucous membrane for a considerable length of time. It is much quicker in its action upon the urine than ammonium benzoate, as in a day or two ordinarily the urine loses its foul odor and alkalinity and becomes clear. Dissolved in Retinol, it is considered especially useful in subacute cystitis, having conquered cases in which other remedies have proven ineffectual.

Externally, Salol is employed as an antiseptic and deodorant powder against impetigo, eczema, sycosis and other skin diseases; and has done good service as an insufflation in the treatment of ozena. In spirituous solutions (5 per cent.) it is used with various flavoring agents in the preparation of mouth-washes and dentifrices, and it enters into the composition of soaps, face powders, and other toilet articles: A mixture of equal parts of Camphor and Salol, heated together, has given good results in the treatment of suppuration of the middle ear, giving no pain and setting up no inflammation of the part.

Salophen is considered non-toxic in its action upon the organism, while affording all the medicinal qualities of Salol. It has been employed with success, in dosage of ʒj to ʒjss daily, in the treatment of acute rheumatism, acute rheumatic arthritis, typhoid fever, cholera and allied conditions; also in neuralgia and sciatica, gastro-enteritis, pyelitis, and cystitis. In intestinal dyspepsia with flatulence and in gastrectasis it has been used with decided benefit, in the latter affection chiefly for the relief of the fermentive disturbances to which the dilated stomach is liable.

Salipyrin has been employed with excellent results in acute and chronic rheumatism, rheumatic sciatica, neuralgia and influenza. In rheumatic fever 15-grain doses are given at short intervals (½ hour to 1 hour), until about ʒij have been taken, continuing with smaller doses for a long time after convalescence to prevent relapses. A dose of 8 grains is often sufficient against neuralgia. It was extensively used during the epidemic of influenza in 1891, and highly extolled for efficiency therein, as well as for its freedom from cardiac action. It has proved highly efficient in the treatment of metrorrhagia, especially in that following labor or abortion. Orthmann employed it with most excellent results in 50 cases of metrorrhagia from various causes, giving gr. xv thrice daily up to a total of ℥ijss in some cases. In no instance were unpleasant effects observed.

As it is not obtainable in this country, by reason of a legal conflict between its patentees and those of Antipyrin, and as it is a very loose combination at best, Dr. Squibb suggests that there is no reason whatever why just as good results should not be obtained from the administration of its constituents in conjunction, in proper doses to suit each individual case, and in the proportion of about 3 of Salicylic Acid to 2 of Antipyrin.

SALVIA, Sage,—the leaves of *Salvia officinalis*, the common garden Sage, a perennial plant of the nat. ord. Labiatæ, native in Southern Europe but cultivated in our gardens for its strong, fragrant odor. They contain tannin, resin, etc., and a volatile oil which consists of *Salviol* ($C_{10}H_{16}O$), camphor and terpenes. There are no official preparations. Dose of the powdered leaves, gr. xx–xxx, in infusion.

Sage is aromatic, stimulant, tonic, astringent and a vulnerary. It was highly esteemed in ancient times, and even yet is popular as a domestic cure-all with many people. In infusion it may be used as a beverage in febrile conditions and to check sweating, also for the night-sweats of phthisis. Like other members of the same class it has a slight influence over enteralgia and flatulence. It makes a good astringent and stimulating gargle.

SAMBUCUS, Elder,—the flowers of *Sambucus canadensis*, the common Elder, a shrub of the nat. ord. Caprifoliaceæ. The plant contains a small quantity of a volatile oil, also a resin and valerianic acid. The common Elder of Europe (*S. nigra*) is more [illegible] of a tree, and is official in the Br. Phar. There are no official preparations. Dose, gr. xxx–ʒj, in hot infusion.

Elder-flowers are stimulant and diaphoretic, also diuretic in some degree. The berries are diaphoretic and laxative, while the inner bark is a hydragogue cathartic and in large doses emetic. Formerly the inspissated juice of the berries was employed as an alterative in rheumatism and syphilis, but the flowers are now used only for flavoring purposes. Elder-flower Water (Aqua Sambuci, B. P.) is an excellent vehicle for collyria and lotions.

SANGUINARIA, Blood-root,—is the rhizome, collected in autumn, of *Sanguinaria canadensis*, a perennial plant of the nat. ord. Papaveraceæ, which grows abundantly throughout the U. S., being one of the earliest and most beautiful of the spring flowers. It has a single white flower on an erect stalk, the petals often tinged with rose or purple. It contains 3 alkaloids,—*Sanguinarine*, $C_{17}H_{15}NO_4$, which is probably identical with Chelerythrine (see CHELIDONIUM), *Porphyroxine* and *Puccine*, combined with Chelidonic and Sanguinarinic acids; also resin, gum, albumin, sugar, etc. The salts of its alkaloids are of brilliant red and orange colors and are all soluble in water. Dose of the powdered root as an expectorant, gr. j–v; as an emetic, gr. x–xxx; best given in pill.

Preparations.

Extractum Sanguinariæ Fluidum, *Fluid Extract of Sanguinaria.*—Dose, ♏j–v as an expectorant and stimulant; ♏x–lx as an emetic, cautiously.

Tinctura Sanguinariæ, *Tincture of Sanguinaria,*—strength 15 per cent. Dose, as an expectorant, ♏v–ʒj, as an emetic ʒj–iij.

Sanguinarina, *Sanguinarine*, $C_{17}H_{15}NO_4$ (Unofficial),—is the chief alkaloid and probably the active principle of the plant. Dose, as an expectorant, gr. $\frac{1}{12}$–$\frac{1}{8}$; as an emetic gr. ½ repeated in 10 minutes will produce vomiting after the second or third dose.

PHYSIOLOGICAL ACTION.

Sanguinaria is sternutatory, sialagogue, expectorant and emmenagogue, a systemic emetic, a cardiac paralyzer, a violent irritant, an acro-narcotic poison and an alterative. Its taste is bitter and acrid. It causes violent sneezing when inhaled, increases secretion by irritating the secretory organs as it is eliminated, and in full doses produces salivation, catharsis and vomiting with great depression. Overdoses are violently irritant, the heart's action being at first increased, together with the arterial tension, then markedly depressed, and finally paralyzed by stimulation of its inhibition. The reflexes are lowered by paralysis of the spinal centres, muscular contractility is impaired, the pupils are dilated, the temperature is lowered, cold sweats, great thirst and collapse supervene, and death occurs by paralysis of the cardiac and respiratory centres, often preceded by convulsions. Locally used, Sanguinaria is a feeble escharotic.

Antagonists and Incompatibles.

Amyl Nitrite, Opium, Atropine, etc., to antagonize the depression of the circulation and the local irritant action. Incompatibles are alkalies, Tannin, and most of the metallic salts.

THERAPEUTICS.

As a tonic to the stomach and a stimulant to the liver Sanguinaria or its active principle is well employed in small doses (gtt. iij of the tincture or gr. $\frac{1}{12}$ of the alkaloid) for atonic dyspepsia, duodenal catarrh and catarrh of the biliary ducts with jaundice. Respiratory affections are often remarkably amenable to its influence, particularly chronic nasal catarrh, asthma and acute bronchitis. In these affections expectorant doses are the best, namely gtt. x of the tincture, and in the former the powder locally as a sternutatory. A decoction is a very efficient gargle in the sore-throat of scarlet fever. Sanguinaria is a very serviceable remedy in chronic bronchitis and in amenorrhea of functional character, also in functional impotence from irritability of the organs, with daily seminal losses and relaxation of the genitalia. By many practitioners it is considered a specific emetic in croup, but others look upon it with disfavor as too uncertain and harsh in its action. It has been thought to have alterative properties, and hence is frequently used with Stillingia and other plants in the treatment of strumous and syphilitic affections. In pneumonia of typhoid type and in pleuro-pneumonia it has undoubtedly been of great service in many cases.

Locally, the powdered root is well employed as an application to foul ulcers and fungous granulations, also by insufflation to nasal polypi, and for chronic hypertrophy of the nasal mucous membrane.

Sanguinarine has been used with good results in pneumonia, bronchitis and atonic dyspepsia. Doses of gr. $\frac{1}{12}$ to $\frac{1}{8}$ are expectorant without irritating the stomach, and still smaller doses (gr. $\frac{1}{20}$ to $\frac{1}{10}$) are stimulating to the gastric and intestinal secretions.

SANTALUM ALBUM, White Sandalwood,—the source of the official Oil of Santal, is not itself official. It is a tree of the nat. ord. Santalaceæ, having its habitat in India but now nearly exterminated there. *Santalum citrinum*, the yellow Sandalwood, from the Hawaiian and Fiji Islands, is more commonly met with in commerce.

Oleum Santali, *Oil of Santal, Oil of Sandalwood*,—a volatile oil distilled from the wood of *Santalum album*; a pale-yellow liquid, soluble in alcohol, of peculiar and aromatic odor, pungent taste and acid reaction. Dose, ♏x–xxx, in emulsion or capsules.

Extractum Santali Fluidum, *Fl. Extr. of Santal* (Unofficial).—Dose, ʒj–iij.

Sandalwood is a very agreeable perfume. The Oil is astringent to mucous membranes, producing dryness of the fauces, thirst, colic, and a sense of fulness in the renal regions. In concentrated form it is a local irritant, but the effects of large doses have not been studied. It is extensively used in chronic bronchitis and in gonorrhea, forming the contents of proprietary capsules which are sold for the cure of the latter disease in all drug stores. As found in the shops it is extensively adulterated with oil of cedar and is a very unreliable remedy.

SANTALUM RUBRUM, Red Saunders,—is the wood of *Pterocarpus santalinus*, a tree of the nat. ord. Leguminosæ, native in India. It comes in chips or as a coarse powder, nearly inodorous and tasteless, not imparting any red color to water when macerated in it, but coloring alcohol, ether and alkaline solutions a bright red. The wood has no medicinal properties and is employed solely for the purpose of coloring alcoholic preparations. It is a constituent of Tinctura Lavandulæ Compositus.

SANTONICA, Levant Wormseed,—is the unexpanded flower-heads of *Artemisia pauciflora*, a small, perennial plant of the nat. ord. Compositæ, which grows in Asia Minor, and contains a volatile oil and the peculiar, crystalline principle *Santonin*. Dose, gr. x–lx.

Santoninum, *Santonin*, $C_{15}H_{18}O_3$,—the neutral principle obtained from Santonica. Occurs in colorless, prismatic crystals, turning yellow on exposure to light, odorless, of bitter after-taste, and neutral reaction, nearly insoluble in cold water, but soluble in 250 of boiling water, in 40 of alcohol, 3 of boiling alcohol, 140 of ether, 4 of chloroform, also in solutions of the caustic alkalies. Dose, gr. ¼–j for a child, gr. j–v for an adult, not repeated soon as the action of the drug is slow.

Trochisci Santonini, *Troches of Santonin*,—each troche contains about ½ grain of Santonin, with Sugar, Tragacanth, and Stronger Orange Flower Water. Dose, j–v.

Santonin and its preparation are sensitive to light and should be kept in amber-colored bottles tightly corked.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Santonin is anthelmintic to the round-worm (Ascaris lumbricoides), also but in less degree to the thread-worm (Oxyuris vermicularis). It is taken into the blood as Sodium Santoninate, and affects the cerebral faculties and the vision; objects appearing at first blue, green, or red, then yellow (chromatopsia), often succeeded by blindness for a week or more. Toxic doses disturb the consciousness of the patient, produce a sort of intoxication, tremors, weakness, with enfeebled respiration and slowing of the pulse, coldness of the surface, vomiting, sweating, mydriasis, convulsions, and death from failure of respiration. A dose of 2 grains is said to have proved fatal to a feeble child five years old. It is excreted by the kidneys, coloring the urine if acid a greenish-yellow, if alkaline a reddish-purple, and it produces considerable enuresis.

As an anthelmintic Santonin is the most certain agent against the round-worm, and is best administered in powder with calomel at bedtime after a day of fasting, a senna-draught or a dose of castor oil being used the following morning. It also acts fairly well in suppository against the thread-worm, but is inoperative against tape-worm. Some observers consider it more promptly efficient when given in castor oil, and that the oil lessens the risk of evil after-effects. It has also been prescribed with great benefit for nocturnal incontinence of urine, and for certain eye affections, particularly amblyopia from atrophic or inflammatory changes in the retina and optic nerve. It should never be given to children during a fever, nor when the bowels are constipated, for fear of toxic results.

SAPO, Soap, *White Castile Soap,*—is Soap prepared from soda and olive oil; a whitish solid, hard, yet easily cut when fresh, of faint, peculiar odor, free from rancidity, a disagreeable alkaline taste and alkaline reaction; easily soluble in water and in alcohol. It is an ingredient of several of the official pills.

Sapo Mollis, *Soft Soap, Green Soap,*—is Soap prepared from potassa and linseed oil; a soft, unctuous mass, of a yellowish-brown color, soluble in about 5 of hot water and in 2 of hot alcohol. The name Green Soap is a misnomer, as it is not green in color.

Insoluble Soaps are combinations of the oily acids with earths and metallic oxides. Two are official,—the Soap of the Monoxide of Lead (Emplastrum Plumbi) and the Soap of Lime (Linimentum Calcis).

Saponification is a process of double decomposition between a fat (stearate, palmitate or oleate of glyceryl) and an alkali, in which glycerin and the metallic salt of the fatty acid are formed. The glycerin, not being saponifiable, is set free, but the fatty acid (stearic, palmitic or oleic) unites with the salifiable base to form soaps, which are therefore mixed stearates, oleates and palmitates of various bases. Nearly all soaps are oleates or palmitates (or both) of sodium or potassium (or both). Hard soaps are soda soaps, soft soaps are potassium soaps. [Compare the articles entitled Olivæ Oleum, Adeps, Acidum Oleicum, Glycerinum.]

Unofficial Soaps.

Sapo Animalis, *Curd Soap,*—official in the Br. Phar.,—is made with Soda and a purified animal fat, and consists chiefly of Stearin. Used in pills and suppositories.

Sapo Medicatus,—official in the Fr. Codex,—is a Soda soap prepared from expressed Almond Oil.

Preparations.

Emplastrum Saponis, *Soap Plaster,*—has of Soap 10, Lead Plaster 90, Water q. s.

Linimentum Saponis, *Soap Liniment,*—has of Soap 7, Camphor 4½, Oil of Rosemary 1, Alcohol 75, Water to 100. **Opodeldoc** is a similar preparation. Soap Liniment is an ingredient of Chloroform Liniment.

Linimentum Saponis Mollis, *Liniment of Soft Soap, Tincture of Green Soap,*—has of Soft Soap 65, Oil of Lavender 2, Alcohol 30, Water to 100.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Soap is laxative, antacid and antilithic; externally it is a stimulating discutient, and is used for cleansing the skin, removing fatty substances and softening the epidermis, but if too long applied it may prove decidedly irritant. It is a good antidote in poisoning by acids, and should be administered freely in such cases until more energetic alkalies can be obtained. In aqueous solution it makes a useful enema for constipation, or a plug of soap may be inserted into the rectum.

Soft Soap is a powerful detergent stimulant and is much employed in skin diseases, especially eczema rubrum, in which the tincture is rubbed on, the diseased skin well washed and then covered with a bland ointment. The tincture is the most elegant form for use, and may be diluted with three parts of alcohol for shampooing the scalp.

The Liniment is used with friction in sprains, bruises and stiff joints, being a little more stimulating than camphor-liniment. It makes a good basis for extemporaneous liniment prescriptions.

SARSAPARILLA,—is the root of *Smilax officinalis, Smilax medica,* and of other undetermined species of *Smilax,* plants of the nat. ord. Liliaceæ, growing in Mexico, Brazil, etc. There are six commercial varieties on the market, which are put up in differently formed bundles. It contains starch, resin, calcium oxalate, an essential oil, and an acrid neutral principle named *Parillin* or *Smilacin,* which when acted on by dilute sulphuric acid affords another principle, *Parigenin.*

Preparations.

Extractum Sarsaparillæ Fluidum, *Fluid Extract of Sarsaparilla.*—Dose, ʒ ss–j.

Extractum Sarsaparillæ Fluidum Compositum, *Compound Fluid Extract of Sarsaparilla,*—has of Sarsaparilla 75, Glycyrrhiza 12, Sassafras 10, Mezereum 3, Glycerin 10, Water and Alcohol to 100. Dose, ʒ ss–j.

Syrupus Sarsaparillæ Compositus, *Compound Syrup of Sarsaparilla,*—has of the Fluid Extract 20, Fl. Ext. of Glycyrrhiza 1½, Fl. Ext. of Senna 1½, Sugar 65, Oils of Sassafras, Anise and Gaultheria, each 0.01, Water to 100. Dose, ʒ j–℥ j.

Decoctum Sarsaparillæ Compositum, *Compound Decoction of Sarsaparilla,*—has of Sarsaparilla 10, Sassafras 2, Guaiacum Wood 2, Glycyrrhiza 2, Mezereum 1, Water to 100. Dose, ℥ j–iv.

Syrup of Sarsaparilla (Unofficial),—much used in flavoring soda-water, is a mixture of the oils of sassafras and gaultheria in syrup.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Those who believe that Sarsaparilla has any action ascribe to it properties as a diuretic, diaphoretic, tonic and alterative. Careful physiological experiments with the drug and its principle have so far given negative results. It has been used as a so-called "blood-purifier" in scrofula, chronic abscesses, necrosis, old ulcers, many cutaneous diseases, etc., but is generally combined with other agents of undoubted activity. The compound decoction is considered a good agent in tertiary syphilis, especially in debilitated subjects; while the other preparations are commonly employed as vehicles for potassium iodide and mercuric chloride in syphilis of any form. Whenever used, the compound decoction will give the best results, the hot water and its other constituents having medicinal value if the principal ingredient has none.

SASSAFRAS,—is the root-bark of *Sassafras variifolium*, an indigenous tree of the nat. ord. Laurineæ. The volatile oil is official, and contains as its principal constituent *Safrol*, which is largely used to disguise the odor of the fatty bases in soap manufacturing.

Sassafras Medulla, *Sassafras Pith*,—is the pith of the above-mentioned tree. Macerated in water it forms a mucilaginous liquid which does not give a precipitate on the addition of alcohol.

Mucilago Sassafras Medullæ, *Mucilage of Sassafras Pith*,—has of the pith 2, in water 100. Dose, indefinite.

Oleum Sassafras, *Oil of Sassafras*,—a volatile oil distilled from Sassafras,—a colorless or yellowish liquid, having the odor of Sassafras, a warm, aromatic taste and a neutral reaction, readily soluble in alcohol. Treated with cold nitric acid it becomes of a dark red color, and is finally converted into a red resin. Dose, ♏j–iv.

Infusum Sassafras, *Infusion of Sassafras* (Unofficial),—is a popular "tea" which may be taken *ad libitum*. When made from the bark, and taken internally as well as applied locally, it is almost a specific for the rash produced by poison oak (Hinton).

Sassafras is a constituent of the three compound Sarsaparilla preparations. It acts as a stimulant diaphoretic when used in quantity of the hot infusion. It enjoys a popular reputation as a "blood-purifier," and has a destructive influence on infusoria. It is employed chiefly in combination with Sarsaparilla and Guaiacum in cutaneous disorders and rheumatic and syphilitic affections. The mucilage of the pith is an excellent demulcent drink in acute gastritis and enteritis, or in poisoning by irritant and corrosive agents. It may also be used in extemporaneous prescriptions to hold insoluble substances in suspension and for flavoring purposes. The oil is chiefly used for flavoring in mixtures and confectionery. The syrup popularly known as "Sarsaparilla" is composed of Oil of Sassafras and Oil of Gaultheria, in syrup.

Dr. J. Bartlett, of Chicago, in a paper on the toxic properties of Sassafras, published in the *Pharmaceutical Journal*, says that it appears to have some resemblance to three familiar drugs—opium, strychnine, and ergot; for it has a narcotic and sudorific action; a property of inducing tetanic and clonic spasms followed by paralysis, and a probable stimulant effect on the uterus.

SCAMMONIUM, Scammony,—is a resinous exudation from the root of *Convolvulus Scammonia*, a plant of the nat. ord. Convolvulaceæ, growing chiefly in Syria and Asia Minor. It contains about 80 per cent. of *Resin*, with gum, sugar, starch, etc. The active principle, *Jalapin*, is probably identical with the Convolvulin of Jalap, and is contained in the root, the resin, etc. Dose, gr. v–x.

Resina Scammonii, *Resin of Scammony*,—soluble in ether. Dose, gr. iij–viij.

Extractum Colocynthidis Compositum,—(see *ante*, page 285) contains 14 per cent. of Resin of Scammony, and is an ingredient of the Compound Cathartic Pill.

Scammony is an active cathartic, stimulating the liver and the intestinal glands, and causing free purgation in a few hours with considerable griping. Its solution in the bile is necessary to its action, and it combines with the soda in that secretion. Though quite drastic in action it is somewhat uncertain as a purgative and is generally employed in combination with similarly acting agents. It is anthelmintic against the tapeworm, and in overdoses produces a high degree of irritation. It is used as a drastic purgative for children with calomel or potassium sulphate, when an active cathartic is indicated. In the same way it is the appropriate agent on the principle of derivation in dropsies and cerebral affections, also in torpid states of the intestines with much slimy intestinal mucus; but it is contraindicated in cases attended by irritability of the stomach and bowels.

SCILLA, Squill,—is the sliced bulb of *Urginea maritima*, a perennial plant of the nat. ord. Liliaceæ, growing on the shores of the Mediterranean. Its active principle has not yet been definitely isolated, but it is probably the acrid, bitter glucoside *Scillitoxin*. Other principles have been obtained and are named *Scillipicrin*, *Scillitin* and *Scillin*, also a peculiar carbo-hydrate or mucilage named *Sinistrin* and the usual constituents of plants. Dose, in powder, gr. j–iij.

Preparations.

Extractum Scillæ Fluidum, *Fluid Extract of Squill.*—Dose, ♏j–v.

Tinctura Scillæ, *Tincture of Squill*,—15 per cent. Dose, ♏v–xxx.

Acetum Scillæ, *Vinegar of Squill*,—10 per cent. Dose, ♏x–ʒj.

Syrupus Scillæ, *Syrup of Squill*,—has of the Acetum 45 parts, with Sugar 80 and Water to 100. Dose, ʒss–ij.

Syrupus Scillæ Compositus, *Compound Syrup of Squill*,—has of the fluid extracts of Squill and Senega, each 8, Tartar Emetic 0.2, Calcium Phosphate 1, Sugar 75, Water to 100. Is known popularly as *Coxe's Hive Mixture*, and contains less than one grain of Tartar Emetic to the fluid ounce (15 grains in 17 fl. ozs.). Dose, for children, ♏v–ʒj, the latter being an emetic dose; for adults, as an expectorant, ♏xx–xxx.

Physiological Action and Therapeutics.

In small doses Squill is expectorant, in larger doses emetic and diuretic, and in overdoses it is a violent irritant poison, producing nausea, vomiting, purging, gastro-enteritis, strangury, bloody urine, perhaps suppression of urine, paralysis and convulsions, with death by paralysis of the heart in systole. Medicinal doses slow the heart, making the pulse stronger and slower, raising the arterial tension, and increasing the flow of urine (like Digitalis). Its active constituents diffuse into the blood, and its systemic effects follow on its application to the skin and seem to be exerted upon the mucous membrane of the secretory organs, especially affecting the bronchial, gastro-intestinal and genito-urinary.

Squill is employed in medicine for its expectorant and diuretic effects. It is especially applicable in cardiac dropsy, combined with digitalis or the saline diuretics, and in chronic bronchitis, in which it may be associated with ipecac or ammonia, asafetida, benzoin, etc. It is also used in croup, but is usually combined in this affection with some other emetic, as tartar emetic in the compound syrup, a mixture which may produce very depressing effects and should be used with caution. In whooping-cough and other irritant coughs with tickling sensations in the throat the Syrup or Vinegar of Squill is often of great service.

The action and uses of Squill should be studied in connection with those of Digitalis and Ipecacuanha.

SCOPARIUS, Broom,—the tops of *Cytisus Scoparius*, the Broom-plant, a common garden shrub of the nat. ord. Leguminosæ, having small, downy leaves and numerous large golden-yellow flowers. It contains *Scoparin*, $C_{21}H_{22}O_{10}$, a neutral, crystallizable principle; also *Sparteine*, $C_{15}H_{26}N_2$, a volatile, liquid alkaloid, which contains no oxygen, but possesses very decided basic qualities and is highly poisonous.

Preparations.

Extractum Scoparii Fluidum, *Fluid Extract of Scoparius*,—made with diluted alcohol. Dose, ℨ ss–ij.

Decoctum Scoparii, *Decoction of Broom-tops* (Unofficial),—℥j to the pint. Dose, ℥j every three hours until a diuretic effect is produced.

Sparteinæ Sulphas, *Sparteine Sulphate*,—white, prismatic crystals, or a granular powder, of slightly saline and bitter taste, very soluble in water and in alcohol. Dose, gr. $\frac{1}{16}$–$\frac{1}{2}$, hypodermically, gr. ½–ij by the mouth. Small doses, gr. $\frac{1}{16}$–$\frac{1}{4}$, every five hours, for cardiac action; larger, gr. j–ij, for diuresis (Clarke). Larger doses are necessary, say gr. iss–iij, ter die (Prior).

PHYSIOLOGICAL ACTION.

Broom-tops are diuretic and laxative, also emetic and cathartic in large doses. In the form of decoction they have long been a favorite diuretic and vehicle for other diuretics in the treatment of dropsies, both cardiac and renal, but are considered most reliable in dropsy of renal origin.

Sparteine has been thought to resemble Coniïne in its action, paralyzing the end-organs of the motor nerves and vagi, lowering the reflex excitability of the cord, and causing death by paralyzing the respiratory centre in the medulla. Later observations, however, place it in the Digitalis group, and in the front rank thereof. In small doses it slows and strengthens the heart-beats and raises the arterial tension, at the same time increasing the cutaneous and renal circulation, so that the surface becomes flushed and moist, and in some cases marked diuresis and diaphoresis occur. The respiration, at first quickened, is soon slowed and deepened, the patient experiencing a sense of increased warmth and well-being, and if suffering from irregular cardiac action, precordial distress and dyspnea, these symptoms are promptly relieved. If the pulse has been abnormally slow Sparteine will quicken it, though its general action is to slow the cardiac rate. An overdose brings on marked palpitation, a small and rapid pulse of high tension, precordial pain and a sense of "tightness" about the chest, with anxiety, and a feeling of great debility, perhaps even muscular tremor. Death occurs by asphyxia from depression of both the centre and the muscles of respiration.

Sparteine acts directly on the cardiac muscle as well as upon the inhibitory apparatus, giving greater force to the cardiac contractions and regulating (generally slowing) the pulse-rate. It also stimulates the vasomotor centre to contract the vessels throughout the splanchnic area, thus increasing the circulation in the skin and kidneys and raising arterial tension generally. Its diuretic power on healthy persons is denied by some observers and affirmed by others, though all acknowledge it in disease. It is accompanied by increased excretion of urea, is due to the increase of blood-pressure both behind and in front of the renal circulation, and is produced only by large doses, gr. ½–gr. ij.

The action of Sparteine upon the circulation is manifested quickly as compared with that of other similarly acting drugs. In ½ hour after its ingestion the pulse is markedly slower, in another ½ hour the arterial tension rises, and both effects last from 5 to 6 hours. When taken regularly for several days or weeks its influence remains for nearly a week after its discontinuance. There is no danger of cumulative action. Though the dosage employed has varied from gr. $\frac{1}{16}$ every 4 hours to gr. xij in 24 hours, no toxic action was observed, nor was there any evidence of accumulation, even when given continuously for 3 to 4 months. (Clarke.) Only from a dose of gr. xxxj were evil effects observed. (Prior.)

THERAPEUTICS.

Broom-tops are a favorite remedy for dropsy of cardiac origin and for the anasarca of chronic kidney disease, but are inadmissible in acute renal affections or where pulmonary congestion or inflammation exists.

Sparteine has been employed with very great benefit in cardiac affections requiring stimulation of the heart's action with the smallest possible increase of arterial tension, also the relief of dyspnea, precordial pain, palpitation and edema. In such cases small doses, gr. $\frac{1}{16}$ to $\frac{1}{4}$, are best, and as the influence of the drug is remarkably sustained they need not be repeated oftener than once in 5 or 6 hours. It has given the most marked satisfaction in mitral regurgitation, in which it relieves all the symptoms; also in mitral stenosis, when the pulse is small, weak and irregular. In aortic regurgitation, it quiets the excited action of the heart without unduly prolonging the systole, and is of great value. Used in chronic Bright's disease, with hypertrophy and high arterial tension, it stimulates the heart without increasing the tension. In exophthalmos it gives remarkable relief to all the symptoms. For cardiac palpitation and arrhythmia, small doses are of great service. In asthma it is of signal benefit, cutting short the paroxysms and rendering their recurrence much less frequent. In the opium-habit it is used at periods of depression during the treatment, to overcome the plateau shown in the sphygmographic trace by stimulating the cardiac action. (Jennings.) For this purpose, doses of gr. iss–iij three or four times daily are necessary. (Prior.)

SCUTELLARIA, Skull-cap,—is the plant *Scutellaria lateriflora*, an indigenous, perennial herb of the nat. ord. Labiatæ, growing in moist places and along ditches. It contains a little volatile oil, traces of a bitter principle, besides fat, tannin and sugar.

Extractum Scutellariæ Fluidum, *Fluid Extract of Scutellaria.*—Dose, ʒss–ij.

Scutellaria produces no very obvious effects when taken internally. By some practitioners it is said to have tonic, nervine and antispasmodic powers, and it has been used in domestic practice to calm the nervous system in diseases characterized by restlessness, tremors, spasms, twitching of the muscles, hyperesthesia, etc., as chorea, delirium tremens, nervous exhaustion from fatigue or over-excitement, hydrophobia, hysteria and epilepsy. The Scutellarin of the eclectics is not a proximate principle, but an extract precipitated by alum from a concentrated aqueous tincture. It is given in dose of gr. j–iv.

SENEGA,—is the root of *Polygala Senega*, an indigenous, perennial plant of the nat. ord. Polygaleæ, having small, white flowers in a close spike at the summit of the stem. Its principal constituent is the glucoside *Senegin*, $C_{32}H_{54}O_{18}$, which is identical with Saponin, and closely allied to Digitonin. It is a white, amorphous powder, readily soluble in alcohol and hot water, forming a soapy emulsion when mixed with boiling water, and decomposed by HCl into sugar and *Sapogenin*, $C_{14}H_{22}O_2$.

Preparations.

Extractum Senegæ Fluidum, *Fluid Extract of Senega.*—Dose, ♏x–xx.

Syrupus Senegæ, *Syrup of Senega*, has of the fluid extract 20, Aqua Ammoniæ ½ Sugar 70, Water to 100. Dose, ʒj–ij.

Syrupus Scillæ Compositus, *Compound Syrup of Squill*,—contains 8 per cent. of Senega. (See under SCILLA, page 475.)

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Senega is a stimulating expectorant, a diuretic and a diaphoretic. It causes irritation of the throat, with some salivation and gastro-intestinal irritation, an inclination to cough, increased bronchial secretion, and perhaps some diuresis and diaphoresis. Inhaled as a snuff it is very irritant to the mucous membrane of the nose, causing cough, sneezing and nasal catarrh. Senegin is violently irritant and a powerful depressant of the heart, and of the vascular, nervous and muscular systems. It is excreted by the bronchial mucous membrane, the kidneys and the skin, all of which it stimulates and in large quantity irritates.

The use of Senega is chiefly that of a stimulating expectorant in chronic bronchitis, the second stage of acute bronchitis, typhoid pneumonia, asthma and croup, also as a diuretic in dropsy due to renal disease. It removes the tightness and oppression experienced in the subacute chest affections, relieves cough and rapidly promotes expectoration. When the mucus is tough and scanty this remedy is of no value. It has been used with benefit in amenorrhea, given in saturated decoction for two weeks before the expected period. In chronic rheumatism and in rheumatic paralysis its stimulating and diaphoretic powers have been of great value. Senegin has been successfully used in 2-grain doses as a remedy for uterine hemorrhage.

SENNA,—the leaflets of *Cassia acutifolia* (Alexandria Senna), and of *Cassia angustifolia* (India Senna), shrubs of the nat. ord. Leguminosæ, growing in Egypt and India. They contain an amorphous glucoside, *Cathartic Acid*, $C_{180}H_{192}N_2SO_{82}$, which forms salts with bases and may be decomposed into glucose and Cathartogenic Acid. Other constituents are *Sennapicrin* and *Sennacrol*, both glucosides; *Catharto-mannite*, a peculiar, unfermentable sugar; also a coloring matter allied to Chrysarobin, and various vegetable salts.

Preparations.

Extractum Sennæ Fluidum, *Fluid Extract of Senna*,—an excellent preparation. Dose, ʒss–℥ss.

Syrupus Sennæ, *Syrup of Senna*,—has of Alexandria Senna 25, Oil of Coriander ½, Alcohol 15, Sugar 70, Water to 100. Dose, ʒj–℥j.

Confectio Sennæ, *Confection of Senna*,—has of Senna 10, Cassia Fistula 16, Tamarind 10, Prune 7, Fig 12, Sugar 55½, Oil of Coriander ½, Water to 100. Is sold under the trade names *Tamar-Indien*, *Tropical Fruit Laxative*, etc. Dose, ʒj–ij.

Infusum Sennæ Compositum, *Compound Infusion of Senna, Black Draught*,—has of Senna 6, Manna 12, Magnesium Sulphate 12, Fennel 2, Boiling Water 80, Cold Water to 100. Dose, ℥j–iij.

Pulvis Glycyrrhizæ Compositus, *Compound Liquorice Powder* (See under GLYCYRRHIZA),—contains 18 per cent. of Senna. Dose, ʒss–ʒjss.

Syrupus Sarsaparillæ Compositus, *Compound Syrup of Sarsaparilla* (See under SARSAPARILLA),—contains 1½ per cent. of the fluid extract of Senna. Dose, ʒj–℥j.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Senna is a very efficient and safe cathartic, producing copious yellow stools in about 4 hours, with considerable griping and flatulence, which may, however, be lessened by combining it with carminatives. Its action is chiefly expended on the small intestine, and it increases both peristalsis and secretion. It has no irritant quality in ordinary doses, and does not produce hypercatharsis, or leave constipation as an after-result. Its infusion injected into the veins causes both vomiting and purging; and in large doses by the mouth it produces nausea, vomiting, flatulence, excited pulse and drastic purgation with severe tenesmus, but its effects are never poisonous. It may cause hemorrhoids and increase the menstrual flow in women. Given to a nursing mother her milk will acquire purgative powers. In some very susceptible persons the odor of the leaves or of the infusion will cause an evacuation of the bowels. Its odor and taste are particularly disagreeable, especially when administered in infusion.

Senna would probably take rank as our best and safest cathartic but for the nauseousness of its smell and taste. It is a favorite laxative in England for children, and is used with great benefit in habitual constipation or where prompt evacuation of the bowels is required. In hemorrhoids and anal fissure it is employed to produce soft and easy motions; but if a tendency to hemorrhoids exists, the use of this drug in cathartic doses will cause irritation of the part and induce an acute attack. For the same reason it is contraindicated in hemorrhage or inflammation of the intestinal mucous membrane, menorrhagia, and abortion. The least disagreeable of its preparations are the Confection of Senna and the Compound Liquorice Powder.

SERPENTARIA, Virginia Snake-Root,—is the rhizome and roots of *Aristolochia Serpentaria* and of *Aristolochia reticulata*, indigenous herbaceous plants of the nat. ord. Aristolochiaceæ, growing in rich, shady woods, with purple flowers arising from joints near the root. It contains a volatile oil, a camphor-resin and a bitter principle named *Aristolochine*, which is soluble in both alcohol and water. All its preparations should be made from the fresh root, as it deteriorates by keeping.

Preparations.

Extractum Serpentariæ Fluidum, *Fluid Extract of Serpentaria.*—Dose, ♏x-xx.

Tinctura Serpentariæ, *Tincture of Serpentaria*,—10 per cent. Dose, ℥ss-ij.

Tinctura Cinchonæ Composita, *Compound Tincture of Cinchona*,—has two parts of Serpentaria in 100. (See *ante*, under CINCHONA.) Dose, ℥j-ij.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Serpentaria is a stimulant expectorant and tonic, a cardiac stimulant, a diaphoretic, diuretic, emmenagogue, aphrodisiac, and somewhat of an antiperiodic. Its taste is warm and pungent, its odor is characteristic. Small doses promote appetite and digestion, increase the bronchial and intestinal secretions, the action of the heart, the cutaneous circulation and the surface temperature, and produce mental exhilaration. Large doses are irritant, causing nausea and vomiting, vertigo and headache, colic, borborygmi, rectal tenesmus, flatulent distention and frequent but not watery stools. The irritant action seems to produce gas rather than fluid. Pruritus ani and hemorrhoids are occasionally caused by its use.

Serpentaria is chiefly employed as a vehicle for other stimulant drug but has many uses of its own. In bronchial affections it is extreme valuable as a stimulating expectorant. In typhoid pneumonia it is good vehicle for ammonium carbonate, and in the exanthemata it is used when much depression exists. It is indicated in typhoid conditio erally, and in the amenorrhea of anemia and chlorosis it is an efficie emmenagogue in many cases. It will often restore the waning sexual power in functional impotence, while in bilious vomiting it frequently checks the nausea and settles the stomach. It is used as a vehicle for cinchona in remittent fever. In diphtheria, scarlatina, etc., an infusion forms an excellent gargle. Its diaphoretic and diuretic properties, though slight, are sometimes of avail in chronic rheumatism.

SESAMI OLEUM, Oil of Sesamum, *Teel Oil, Benné Oil,*—is a fixed oil expressed from the seeds of *Sesamum indicum*, or Benné plant (nat. ord. Pedaliaceæ), which is a native of India, but is cultivated in the southern portion of the U. S. It is a yellowish or yellow, oily liquid, inodorous or nearly so, having a bland, nut-like taste and a neutral reaction. It is a bland fixed oil, very similar in its properties to olive oil, and may be used for the same purposes. It is rich in Olein (76 per cent.) and keeps better than olive oil. It is chiefly employed as a hair-oil.

SILICATES of Sodium (Na_2SiO_3), of Potassium (K_2SiO_3), and of Magnesium ($2MgO3SiO_2$) are used in medicine and surgery, a solution of the Sodium Silicate being official.

Liquor Sodii Silicatis, *Solution of Sodium Silicate, Soluble Glass Solution,*—is a semi-transparent, colorless or yellowish, viscid liquid, odorless, of sharp saline and alkaline taste and alkaline reaction. A small quantity should not produce any caustic effect when applied to the skin. It usually contains about 20 per cent. of Silica and 10 per cent. of Soda, and is used on bandages to make immovable dressings, being lighter than plaster-of-Paris and stronger than starch.

Liquor Potassii Silicatis, *Solution of Potassium Silicate* (Unofficial),—also known as Soluble Glass Solution,—is used for immovable dressings in the same manner as the preceding. A mixture of 2 parts of this solution with one of the soda salt solution is said to set more quickly and firmly than either solution separately. Diluted (1 to 4) the solution of Potassium Silicate has been applied locally in erysipelas, gonorrhea, cystitis, vaginitis, etc., as an antiseptic with good results.

Magnesii Silicas Hydratus, *Hydrated Magnesium Silicate, Meerschaum,* $2MgO,3SiO_2 + 2H_2O$ (Unofficial),—a mineral used for the manufacture of smoking-pipes, and employed in France as a substitute for Bismuth Subnitrate in obstinate choleraic diarrhea, to protect the intestinal mucous membrane or as an absorbent. It is given in fine powder and in doses of ʒj-iv per diem.

SINAPIS, Mustard,—is official under the two following titles, but he pharmacopœial preparations are directed to be made from Black Mustard only.

Sinapis Alba, *White Mustard,*—the seed of *Brassica alba,* an annual lant of the nat. ord. Cruciferæ, cultivated in our gardens. It has yellow owers in racemes, and ribbed pods with a long, ensiform beak.

White Mustard contains *Myrosin*, a ferment, and *Sinalbin*, a crystalline substance, hich reacting on each other in the presence of water produce *Sulpho-cyanate of Acrinyl*, rubefacient principle allied to the volatile oil of black mustard. It also contains *Sinapine*, an alkaloid, *Erucic* or *Brassic Acid*, and a bland, fixed oil, all three of which are contained also in black mustard.

Sinapis Nigra, *Black Mustard,*—is the seed of ***Brassica nigra,*** an annual plant of the nat. ord. Cruciferæ, native of Europe, but naturalized in the U. S. It has small, yellow flowers on peduncles at the end of the branches, also smooth, erect pods with a short beak.

Black Mustard contains *Myrosin,* a ferment, and *Sinigrin* (potassium myronate), which reacting on each other in the presence of water produce the *Sulpho-cyanide of Allyl,* or *Volatile Oil of Mustard.* It also contains *Sinapine,* an alkaloid, *Erucic* or *Brassic Acid,* and a bland, fixed oil; all three of which are contained also in white mustard.

Commercial Flour of Mustard (Unofficial),—is a mixture of white and black mustard seeds ground to a fine powder. It may be employed in lieu of either variety. Dose, as an emetic, ʒij–iv.

Preparations.

Oleum Sinapis Volatile, *Volatile Oil of Mustard, Sulpho-cyanide of Allyl,* C_4H_5NS,—a colorless or pale yellow liquid, of pungent, acrid odor and taste and neutral reaction, almost insoluble in water but freely soluble in alcohol and ether. Dose, ♏⅛–¼.

Charta Sinapis, *Mustard Paper,*—Consists of Black Mustard, the fixed oil removed by percolation with Benzin, mixed with Solution of Gutta-Percha and spread on paper. Each square inch should contain about gr. vj of Mustard. For local use.

Linimentum Sinapis Compositum, *Compound Liniment of Mustard,*—has of the Volatile Oil 3, Fl. Ext. of Mezereum 20, Camphor 6, Castor Oil 15, Alcohol to 100.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Locally used, Mustard is rubefacient, counter-irritant, and a nervous stimulant, causing heat, redness and severe burning pain. Its prolonged application produces vesication by inducing local inflammation. Internally it is a local emetic in full doses, in smaller doses a condiment and carminative. Its irritant effect on the gastric mucous membrane is much less powerful than on the skin.

Mustard is commonly used as a local application to relieve local pain, to stimulate the viscera, and to produce counter-irritation. These objects find their application in muscular rheumatism, neuralgia, colic, gastralgia, inflammation of the throat, larynx, bronchi, lungs, pleuræ and pericardium; also as a derivative in headache, cerebral congestion, and suppressed menstruation. It may be used as a stimulant to the heart, vascular system and respiratory apparatus. When action of a mild character is desired it may be diluted with flaxseed or flour. Internally it may be employed as an emetic in indigestion or narcotic poisoning. Its use as a condiment is familiar, acting by stimulation of the gastric mucous membrane. In overdoses it may excite severe gastritis. White Mustard seed, unground, has been used as a laxative, as it produces no irritation. The Oil is one of the most irritant of the volatile oils, producing severe gastro-enteritis. It is used chiefly as an ingredient of stimulating liniments, but may be employed internally in small doses.

UM, Natrium, Na.—This metal is represented by a number
salts, which are generally colorless or white, and with very few
s are readily soluble in water. Some of them are found native,
loride (in sea-water, salt lakes, salt mines), the Nitrate (in
deserts), and the Borate (in lakes of Persia, California, etc.).
onate is found in the ashes of marine plants. From the Chlo-
pared the Sulphate, from this the Carbonate, and from the latter
he other salts are prepared. All sodium salts impart a yellow
lame, which should not appear more than transiently red when
through a blue glass. The latter cuts off the yellow rays but
violet ones of potassium to be seen.

Sodium Compounds and their Preparations.

odium Hydrate, Caustic Soda, NaOH,—a white, hard, opaque solid, deliques-
st air, efflorescent in dry air, odorless, of intensely acrid and caustic taste and
aline reaction, soluble in 1.7 of water at 59° F., and in 0.8 of boiling water,
in alcohol. Is a powerful caustic, but milder than Potassa, and should be
-stoppered bottles made of hard glass.

Sodæ, *Solution of Soda*,—contains about 5 per cent. of the hydrate, and may
by dissolving 56 of Soda in 944 of Distilled Water. It is a clear, colorless
less, of acrid and caustic taste and strongly alkaline. Dose, ♏v–ʒss, well
water.

cetas, *Sodium Acetate*, $NaC_2H_3O_2 + 3H_2O$,—large, transparent prisms, efflo-
ry air, odorless, of saline, bitter taste and a neutral or faintly alkaline reaction,
4 of water and in 30 of alcohol at 59° F., in ½ of boiling water and in 2 of
hol. Dose, gr. xx–ʒj.

arbonas, *Sodium Carbonate*, $Na_2CO_3 + 10H_2O$,—large, colorless crystals,
rescent, with a harsh alkaline taste and strongly alkaline reaction; very solu-
, insoluble in alcohol. Of it 20 grains will neutralize 9.7 grains of Citric
½ grains of Tartaric Acid. Dose, gr. v–xxx.

arbonas Exsiccatus, *Dried Sodium Carbonate*,—is the Carbonate 200 parts
eat of 113° F., until it is converted into a white powder weighing 100 parts.
sed for pharmaceutical purposes.

icarbonas, *Sodium Bicarbonate*, $NaHCO_3$,—an opaque, white powder, per-
he air, odorless, of cooling, saline taste, and a slightly alkaline reaction; solu-
of water, insoluble in alcohol, decomposed by hot water and converted into
onate. Of it 20 grains neutralize 16.7 grains of Citric Acid, or 17.8 grains
Acid. It is a constituent of Mistura Rhei et Sodæ and of Pulvis Effervescens
Dose, gr. x–ʒj.

ci Sodii Bicarbonatis, *Troches of Sodium Bicarbonate*,—each troche con-
Bicarbonate about 3 grains, with Sugar, Nutmeg and Mucilage of Tragacanth.

hloras, *Sodium Chlorate*, $NaClO_3$,—colorless, transparent tetrahedrons, per-
ry air, odorless, of cooling, saline taste and neutral reaction; soluble in 1.1
in about 100 of alcohol, also in 0.5 of boiling water and in about 40 of boil-
Should be kept in well-stoppered bottles, and should not be mixed or
riturated with readily oxidizable or combustible substances. Dose, gr. v–xx.

hloridum, *Sodium Chloride, Common Salt*, NaCl,—white, hard, cubical
crystalline powder, permanent in the air, odorless, of a purely saline taste
reaction; soluble in 2.8 of water at 59° F., and in 2.5 of boiling water.
luble in alcohol. Dose, gr. x–ʒj.

itras, *Sodium Nitrate, Chili Nitre, Chili Saltpetre*, $NaNO_3$,—colorless, trans-
tals, slightly deliquescent, odorless, of cooling, saline and bitter taste, and neu-
; soluble in 1.3 of water at 59° F., in 0.6 of boiling water, scarcely soluble
hol. Dose, ℥j–ij.

Sodii Sulphas, *Sodium Sulphate*, *Glauber's Salt*, $Na_2SO_4 + 10H_2O$,—large, colorless, transparent, monoclinic prisms, rapidly efflorescent in air; of cooling, saline taste and neutral reaction; soluble in 2.8 of water at 59° F., in 0.25 of water at 93.2° F., and in 0.47 of boiling water, insoluble in alcohol. Dose, gr. v–xx; as a purgative ℥ ss-j.

Sodii Ethylas, *Sodium Ethylate*, *Caustic Alcohol*, C_2H_5NaO (Unofficial),—is a white powder, often having a brownish tinge, dissolving in water with a hissing sound. Upon contact with the smallest quantity of water or moist living tissue it splits into alcohol and caustic soda. An alcoholic solution is made by dissolving sodium in absolute alcohol, and is used as a caustic. Chloroform decomposes it at once into ether and sodium chloride. It should be kept in a cool place as it is liable to explode.

The **Arsenate** is described under ARSENUM;—the **Benzoate** under BENZOINUM;—the **Borate** under ACIDUM BORICUM;—the **Bromide** under BROMUM;—the **Solution of Chlorinated Soda** under CHLORUM;—the **Iodide** under IODUM;—the **Hypophosphite, Phosphate** and **Pyrophosphate** under PHOSPHORUS;—the **Nitrite** under AMYL NITRIS;—the **Salicylate** under Salicin;—the **Sulphite, Bisulphite** and **Hyposulphite** under ACIDUM SULPHUROSUM;—and the **Sulpho-carbolate** under ACIDUM CARBOLICUM.

PHYSIOLOGICAL ACTION.

The action of the Sodium salts is similar to that of Potassium salts, except that the former are feebler as alkalies, are not so depressant, and are not so poisonous to the cardiac muscle or the nerves. They are diffused more slowly, are neither absorbed nor excreted so readily, and have not so marked a diuretic action. Locally applied in large doses to muscular and nervous tissues they are paralyzant, but not so powerfully as potassium salts. Sodium Urate is not soluble like the urates of lithium and potassium, and is therefore much less readily excreted, forming the masses called chalk-stones in gouty subjects. Soda is a less active escharotic than potash, having less affinity for water. Liquor Sodæ renders the blood and secretions more alkaline, but does not alter nutrition to the extent that liquor potassæ does. The Acetate is converted into the Carbonate in the blood, and is a less active diuretic than the corresponding potassium salts. The Carbonate is chiefly used in the preparation of the other salts. The Bicarbonate is slightly irritant, stimulates the secretion of gastric juice, acts as an antacid and will increase the alkalinity of the blood. The Nitrate is a mild cathartic and in solution is a solvent of false membranes. The Ethylate is an antiseptic and a powerful but almost painless caustic.

Sodium Chloride (common salt) is one of the most important and abundant of the saline constituents of the animal organism, existing normally in the blood, where it keeps the fibrin and albumin in solution; hence in inflammation, being thus needed, it accumulates at the seat of the morbid action disappearing temporarily from the urine; its reappearance therein being considered one of the surest signs of the patient's improvement. In very dilute solution it enables water to dissolve both albumins and globulins, and renders water non-irritant to the animal tissues and harmless to the red blood-corpuscles. For these purposes the solution employed is one of 0.65 per cent., known in experimental physiology as the *normal salt solution*. In substance however or in concentrated solution, the salt is very irritant to cut surfaces, mucous membranes, muscle and nerve tissues. Taken into the stomach in quantity it irritates that organ and induces vomiting. When absorbed in excess of the normal requirements of the body it causes the peculiar nervous irritation expressed by the sense of *thirst;* which is relieved only by the ingestion of water in sufficient quantity to enable the excess to be dissolved and excreted by the kidneys. It is rapidly absorbed, and rapidly excreted; and when consumed in excess it increases tissue-change and consequently the excretion of urea and potassium salts. On the other hand, the excessive ingestion of potassium salts (as in the cases of herbivorous animals and vegetarian cranks) increases the excretion of sodium chloride by a double decomposition between these salts in the blood, forming potassium chloride and sodium phosphate, which being foreign to the blood are constantly excreted. In this way, by a continuous vegetable diet the normal amount of sodium chloride in the organism may be greatly reduced, and the animal will feel the want of it and will travel hundreds of miles to visit a salt-lick. Besides being emetic when given internally, Sodium Chloride also acts as a hemostatic, decreases the secretion of mucus, is a vermifuge against thread-worms, promotes the absorption of pleuritic serous exudations and of dropsies, and has considerable power as an antiperiodic and an antiseptic.

Sodium Sulphate, administered by the mouth in dilute solution, excites active secretion in the intestines, especially in the small intestine, partly by its bitterness but also by its irritant quality and its specific property of stimulating the activity of the intestinal glands. The action is not an osmotic one, as was formerly taught. The stimulation caused by this salt extends to the liver and the pancreas, especially the former. The absorption of the secretions is impeded by the low diffusibility of the salt, so that the result is a large accumulation of fluid in the intestinal canal, which finds its way to the rectum and produces purgation. The more dilute the solution employed the more prompt will be the effect, but this salt will not produce catharsis if administered in concentrated form. When injected into the blood it excites no intestinal secretion, does not act as a purgative, and produces no toxic effect. [Magnesium Sulphate is toxic when so administered.] The quantity of Sodium Sulphate to the pint of Carlsbad water (Sprudel) is 20 grains, in Friedrichsthal 46½ grains, and in Hunyadi Janos from 122 to 173 grains; the latter being the most active hepatic stimulant of the three. A mixture of the Sulphate and the Bicarbonate is sold as the natural salt obtained by evaporation of Carlsbad water.

The action of the other Sodium salts is described under the titles of the respective constituents to which their effects are mainly referable.

Antidotes and Incompatibles.

Poisoning by caustic alkalies is treated by the dilute *Vegetable Acids*, as vinegar, cider, lemon-juice; then demulcent drinks and oils to protect the mucous membrane, and the usual vital supporters. The alkalies and their carbonates are incompatible with the acids and also with metallic salts, and the caustic alkalies decompose most alkaloids.

THERAPEUTICS.

The Sodium salts mentioned in the first paragraph treating of their action are not much used internally, the corresponding Potassium salts being preferred, especially when it is desired to alkalinize the urine or to promote oxidation. In the alkaline treatment of stomach affections the Sodium salts are the most efficient, especially the Bicarbonate, in small doses before meals or on an empty stomach to increase the gastric juice. The same salt is used in diabetes to lessen the amount of sugar, in frontal headache with constipation, the pain being seated at the junction of the forehead with the hairy scalp, also as a wash (gr. ij ad ℥j) in itching skin affections and as a lotion in burns and eczema. The Chloride is used internally as an antidote in poisoning by silver nitrate and as an emetic, and will often relieve hemoptysis and migraine. In bilious diarrhea it is employed in doses of gr. x–ʒj, thrice daily. Locally in baths it is a good stimulant to the skin, and in solution (½ to 1 per cent.) to wash wounds, to cleanse the nasal cavities, or to destroy thread-worms, in which case it is given by enema of the strength of two tablespoonfuls to the pint. The Carbonate may be used in dilute solution locally to prevent itching, but is chiefly employed in the preparation of the other salts. The Sulphate is a good purgative and hepatic stimulant, and is given either alone or with the Bicarbonate in imitation of Carlsbad salts, for bilious disorders, gouty affections, chronic constipation, obesity and diabetes mellitus. The Chlorate has uses similar to those of Potassium Chlorate, and being more soluble can be used in stronger solutions, but this is of doubtful benefit for internal use, as it has all the irritating power on the kidneys and destructive action on the blood possessed by the other salt. The Nitrate is employed as a mild cathartic, and in solution by atomization to destroy the false membrane in diphtheria. The Ethylate has been of service as a caustic in cancer, lupus and nevus, for the latter affection being painted over the growth with a glass rod. Caustic Soda is a better escharotic than caustic potassa, as it has less affinity for water, and hence does not destroy the tissues so deeply, nor has it the same tendency to run over adjacent parts.

The therapeutics of the other sodium salts are described under the titles of the constituents to which their uses are chiefly referable.

SOLANUM CAROLINENSE, **Horse-nettle**, *Sand-brier* (Unofficial),—is a weed belonging to the nat. ord. Solanaceæ, a native of Florida and Carolina. In epilepsy

20 per cent. tincture of the berries is highly recommended, in doses of ʒ ss–j thrice laily. It has also been used with benefit in convulsions due to the albuminuria of regnancy and in other convulsive affections.

SPIGELIA, Pink-root,—is the rhizome and roots of *Spigelia ma-ilandica*, the Carolina Pink, an herbaceous perennial of the nat. ord. oganiaceæ, native of the Southern States; having large, showy flowers, carlet or crimson externally, yellow within. It contains a bitter prin-iple and a volatile oil, also tannin, wax, resin, lignin and salts. Dose, j–ij for an adult, gr. x–xx for a child of 3 years.

Extractum Spigeliæ Fluidum, *Fluid Extract of Spigelia.*—Dose for an adult, ʒ j–ij; or a child of 3 years, ♏x–xx.

Infusum Spigeliæ Compositum, *Compound Infusum of Spigelia*, *Worm Tea* (Unfficial),—has Spigelia 15, Senna 10, Fennel 10, Manna 30, Water 500. Dose, ℥ iss–v.

Spigelia is anthelmintic against the round-worm (ascaris lumbricoides), nd is in popular use as a vermifuge, administered with senna. In large loses it is an uncertain cathartic, and may produce serious symptoms, as ertigo, dimness of vision, dilated pupils, spasms and convulsions. These ffects are most apt to occur when the drug fails to produce purgation, ence it is usually administered with an active cathartic.

Spigelia Anthelmia, *Demarara Pink-root*, *Worm-grass* (Unofficial),—produces omiting, dilated pupils, dyspnea, convulsions and death. If eaten by cattle they perish n great agony. It has been used with real benefit in cardiac affections of rheumatic rigin, also in rheumatic fever and in cardiac palpitation with dyspnea, due to mitral and ortic disease. A tincture (1 to 8) may be used in doses of ♏v–xx.

STAPHISAGRIA, Stavesacre,—is the seed of *Delphinium Staphisagria*, an anual or biennial plant of the nat. ord. Ranunculaceæ, a native of Europe, having bluish r purple flowers in terminal racemes, and seeds in straight, oblong capsules. The seeds ontain an alkaloid *Delphinine*, probably three other alkaloids, a bitter principle, a olatile oil and a fixed oil, etc. There are no official preparations.

Unguentum Staphisagriæ, *Ointment of Staphisagria* (Unofficial),—contains of the owdered seeds 1 part with 2 each of olive oil and lard.

Delphinina, *Delphinine*, $C_{22}H_{35}NO_6$ (Unofficial),—is the active alkaloid, and exists n the fatty oil which is extracted by ether. Dose, gr. $\frac{1}{12}$–$\frac{1}{4}$.

Stavesacre is a violent emetic and cathartic, also parasiticide. The alkaloid is irritant o the skin if locally used, producing tingling, burning and inflammation. Internally, it owers the activity of the heart and respiration and produces a most profound adynamia, nd may prove fatal from paralysis of the spinal cord and asphyxia. In many respects ts alkaloid resembles Aconitine and Veratrine. The ointment is often employed as a arasiticide against pediculi and the acarus scabiei. The fixed oil is probably equally ffective. Delphinine has been used internally in asthma, rheumatism and neuralgia, and n the latter affection is well employed as an ointment (gr. xx to ℥j), applied over the ourse of painful superficial nerves. It has been suggested as an antipyretic and for ropsy. A tincture or fluid extract is a very efficient application against pediculi.

STILLINGIA, Queen's Root,—is the root of *Stillingia sylvatica*, or Queen's Delight, an indigenous, perennial plant of the nat. ord. Euphorbiaceæ. It contains a resin and a volatile oil, but its active principle has not yet been isolated. The fresh root should be used in making the preparations, as those from the dried root are almost inactive. Dose of the powdered root, gr. x–ʒj.

Preparations.

Extractum Stillingiæ Fluidum, *Fluid Extract of Stillingia.*—Dose, ♏x–ʒj.

Tinctura Stillingiæ, *Tincture of Stillingia* (Unofficial).—Dose, ʒss–ij.

Decoctum Stillingiæ, *Decoction of Stillingia* (Unofficial).—℥j ad Oj. Dose, ℥j–ij.

Syrupus Stillingiæ Compositus, *Compound Syrup of Stillingia* (Unofficial),—is composed of Stillingia, Corydalis, Iris, Chimaphila, Coriander, Xanthoxylum, Sambucus, Sugar, Water and Alcohol. For the formula, see U. S. Dispensatory, 17th edition.

Physiological Action and Therapeutics.

Stillingia in large doses is emetic and cathartic, in smaller doses it is expectorant, diaphoretic, diuretic, sialagogue and cholagogue, possessing the various properties which are considered "alterative." Its taste is acrid and pungent and it increases the action of the heart, skin, kidneys, and bronchial mucous membrane, also the gastric, hepatic, intestinal and salivary excretions. Full doses often excite epigastric pain, nausea and vomiting.

Stillingia is much employed with Sarsaparilla and similarly acting drugs as an alterative in syphilitic affections, particularly in chronic cases of the tertiary form, in which the system is greatly reduced by the abuse of mercurials and iodides. In these cases it possesses considerable power and frequently cures. It is highly esteemed in strumous affections, in ascites due to hepatic changes, in portal changes with jaundice following malaria, also in habitual constipation, hemorrhoids from hepatic obstruction, and intermittents. In the latter affection the fluid extract with quinine or arsenic is a very useful combination. A strong decoction is used to ward off an impending paroxysm of ague. The compound syrup, notwithstanding its reputation as a model of polypharmaceutical skill, is still largely used in the West and South.

STRAMONIUM, Thornapple.—The plant *Datura Stramonium,* the Jamestown Weed or Thornapple (nat. ord. Solanaceæ), is official in two forms, the leaves and the seed. It is an annual, of rank and vigorous growth, having a green stem with large white flowers. It grows wild in Southern Russia and the middle United States, and contains an alkaloid, *Daturine* (see next page), which is generally considered identical with Atropine both physiologically and chemically,—also malic acid, albumin, gum, resin, etc.

Stramonii Folia, *Stramonium Leaves,*—the leaves of *Datura Stramonium*, of bitter and nauseous taste. Dose, gr. ij–xx.

Stramonii Semen, *Stramonium Seed,*—the seed of *Datura Stra-*

n, of unpleasant odor when bruised and an oily, bitter taste.
gr. j. The official preparations are all made from the seed.

Preparations.

actum Stramonii Seminis, *Extract of Stramonium Seed.*—Dose, gr. 1/6–1/2.
actum Stramonii Seminis Fluidum, *Fl. Ext. of St. Seed.*—Dose, ♏j–v.
tura Stramonii Seminis, *Tinct. of St. Seed,*—15 per cent. Dose, ♏v–xxx.
uentum Stramonii, *Stramonium Ointment,*—has of the Extract 10, Diluted
5, Benzoinated Lard 85.
rina, *Daturine,* $C_{17}H_{23}NO_3$ (Unofficial),—is the alkaloid found in all parts of
t, also in Datura Tatula. It is a Tropate of Tropin, isomeric and identical with
e. Dose, gr. $\frac{1}{120}$–$\frac{1}{60}$.

PHYSIOLOGICAL ACTION.

action of Stramonium is similar to that of Belladonna in almost
particular, except that Stramonium is more powerful and chiefly
ces the sympathetic nervous system, not affecting the motor or sen-
rves. It excites a greater degree of cardiac irregularity and a more
delirium, and seems to have a special affinity for the generative
tus, being decidedly aphrodisiac in full doses.

reviously stated the alkaloids Atropine, Daturine, Hyoscyamine
uboisine are chemically alike and almost identical physiologically.
ll produce dilatation of the pupil, increase the cardiac action, the
nd respiration rate and cause delirium. Poisoning by one of them
stinguishable from that by another.

Antidotes, Antagonists, and Incompatibles.

e are the same as for Belladonna. Poisoning by Stramonium is not uncommon,
en may eat the seeds, which should be evacuated by an emetic. If physiolog-
ptoms follow *Opium* must be exhibited as the antagonist, but cautiously, lest
arcosis be substituted.

THERAPEUTICS.

monium is chiefly used as an antispasmodic and to relieve pain. In
the leaves are smoked with advantage at the commencement of a
sm, the smoke being drawn into the lungs. In other spasmodic
ns, as hepatic colic, laryngeal cough, chorea and stammering, it
beneficial. In dysmenorrhea and neuralgia it is used in combina-
th opium and hyoscyamus, and in tic douloureux and sciatica it
very efficient. In nymphomania with great mental depression it
ently effective, and in mania of furious character, particularly the
ral form with suicidal tendency, it is highly serviceable in 10 to 20
doses of the tincture every 3 or 4 hours. The ointment is much
irritable ulcers, and as an anodyne application in painful hemor-
and certain cutaneous diseases.

STRONTIUM, Sr.—The metal Strontium is represented in the pharmacopœia by three of its salts, viz.—

Strontii Bromidum, *Strontium Bromide*, $SrBr_2 + 6H_2O$,—colorless, transparent, hexagonal crystals, very deliquescent, of bitter, saline taste; very soluble in water and in alcohol, insoluble in ether. Dose, gr. v–xxx.

Strontii Iodidum, *Strontium Iodide*, $SrI_2 + 6H_2O$,—hexagonal plates, colorless, transparent, of bitter, saline taste; very soluble in water, also in alcohol and slightly so in ether. Dose, gr. v–xxx.

Strontii Lactas, *Strontium Lactate*, $Sr(C_3H_5O_3)_2 + 3H_2O$,—a white, granular powder, or crystalline nodules, of slightly bitter and saline taste; soluble in 4 of water, in less than ½ of boiling water, also in alcohol. Dose, gr. v–xxx.

Strontii Salicylas, *Strontium Salicylate* (Unofficial),—is highly recommended by Dr. H. C. Wood. Dose, gr. v–xxx.

Physiological Action and Therapeutics.

The Strontium salts are among the recent additions to the materia medica. Their marked anti-putrescent and antiseptic properties were first noticed in 1891 by Germain Sée, on patients suffering from gastric dilatation. He found that in such cases the Bromide prevented the acetic and lactic fermentations and the formation of the gases of decomposition. The toxic action, hitherto attributed to the salts of strontium, has been ascertained to be due to barium, which was present in the commercial products used. When pure, they may be safely employed in the same doses, and in the same cases, as the corresponding preparations of potassium and sodium; while they are much less liable to cause eruptions and are more rapidly and completely eliminated by the kidneys.

The Iodide is analogous in action to potassium iodide, its intravenous injection producing at first a rapid elevation of arterial pressure with acceleration of the cardiac rate, followed by slowing of the heart, and later on by lowered blood-pressure with increased heart-rate. It has been used, with good results, in the treatment of scrofulous, rheumatoid and cardiac disorders, especially scrofuloderma, scrofulous otorrhea, and enlarged lymphatic glands; also in lupus vulgaris and ozena.

The Lactate has been successfully employed in diabetes and in albuminuria. It diminishes the amount of albumin in Bright's disease, in the parenchymatous nephritis of rheumatic and scrofulous subjects, and in the albuminuria of pregnancy; for which purpose it should be given in full doses (gr. xxx) thrice daily. It is contraindicated when there is scanty urine or symptoms of uremia. Da Costa held that while the strontium salts are admirable as diuretics in renal affections, they accomplish more in the acute than in the chronic forms of nephritis.

The Salicylate, in doses of gr. v, is one of the best intestinal antiseptics, yielding better results than salol, naphtalin and similar agents. In doses of gr. x–xv it acts very decidedly as a salicylate in gouty and chronic rheumatic conditions, without producing gastric disturbance. In chronic ɔuty conditions and in lithemia with intestinal indigestion, it is one of ıe most valuable drugs we have. (H. C. Wood.)

The uses of Strontium Bromide are mentioned with those of the other romides under the title BROMUM.

STROPHANTHUS,—is the seed, deprived of its long awn, of *trophanthus hispidus*, an African climbing plant (nat. ord. Apocynaceæ), om which the natives extract a toxic preparation known as the Kombé ·row-poison. It contains a crystalline glucoside, named *Strophanthin*, ıe active principle, which is bitter, slightly acid, soluble in water and ı alcohol, but almost insoluble in ether, chloroform, benzin, etc. It is ery plentiful in the seeds (8 to 10 per cent.), and is an agent of great ıergy, the frog being killed by a solution of 1 in 10,000,000.

Preparations.

Tinctura Strophanthi, *Tincture of Strophanthus*, (1 in 20).—Dose, ♏v–x, or ½–ij frequently repeated. A stronger tincture (1 in 8) is on the market.

Strophanthinum, *Strophanthin* (Unofficial).—Dose, gr. $\frac{1}{120}$–$\frac{1}{60}$ hypodermically: gr. has been used, the influence of one such injection upon the circulation having lasted least eight days.

PHYSIOLOGICAL ACTION.

Strophanthus acts primarily upon muscular tissue by direct contact ırough the blood and with great energy. It increases the contractile ɔwer of all striped muscle, and in poisonous quantity it fixes the muscur contraction into a condition of tetanic permanence, the muscle being ıable to resume its normal condition of partial flexibility. As the heart ceives much more blood in a given time than any other muscle in the ɔdy, it is quickly and markedly affected by the strophanthus-charged ıid, and by regulating the dosage the cardiac muscle may be affected by quantity which will not influence the other muscles.

Small doses stimulate the cardiac contractions, increasing the force of ıe ventricular systole and lowering the rate of the heart-beats. At the me time the general blood-pressure is raised and diuresis is produced, ɔth being due to the *vis a tergo*—the direct stimulation of the circulation om behind. Large doses paralyze the heart in systole and leave the ırdiac muscle in a state of contraction resembling cadaveric rigidity. It ɔes not act through the nervous system, but paralyzes the muscular tisıe, striated and non-striated, by direct contact; and when contractility as been once destroyed thereby no stimulus will re-excite it. It does ot affect the vascular system directly.

Compared with Digitalis, Strophanthus is a powerful cardiac stimulant, iffering from digitalis in not producing vaso-motor constriction of the rterioles. It reduces the pulse, lowers body-temperature somewhat, is ıot cumulative in action, and does not cause any gastro-intestinal disturbance. It is diuretic by direct stimulation of the renal circulation; and has power over rigors by its rapid cardiac action, stopping them and preventing their recurrence.

THERAPEUTICS.

Strophanthus is undoubtedly a valuable cardiac stimulant, from the rapidity and permanence of its action, as well as its non-interference with the calibre of the peripheral vessels. It promptly relieves cardiac dyspnea, often modifies the pulse-rate in less than an hour, while the influence of a single dose upon the circulation persists for a long time. It may well replace digitalis in the treatment of chronic Bright's disease and valvular lesions of the heart, when it is important that the work of the heart should not be increased by any additional resistance in the arterial system. It has been reported as exceedingly useful in the treatment of Bright's disease for the dyspnea, orthopnea, dropsy and uremia; also in mitral insufficiency with great anasarca and dyspnea, in palpitation, exaggerated cardiac action, in weak heart, and for exophthalmos with tumultuous action of the heart; also in pulmonary edema due to valvular lesions or to pneumonia. It is useful in endocarditis, also in atheroma of the arteries, in reflex palpitation of neurasthenia, hysteria and chlorosis, and for rigors due to catheterization or operations on the urethra. These high claims, made by enthusiastic therapeutists, have not been maintained by the experience of the general profession, so that this drug is gradually falling into disuse though but recently added to the official pharmacopœia.

Ouabaïn, $C_{30}H_{46}O_{12}$ (Unofficial),—is a glucoside obtained from the root and wood of *Acocanthera Ouabaio*, an apocynaceous tree of the Somali coast; also from the seeds of *Strophanthus glabrus*, a climbing plant from Gaboon. The former furnishes an arrow poison used by the African natives. Ouabaïn occurs in white, odorless crystals, of feebly bitter taste; soluble in hot water and in spirit, slightly in cold water, insoluble in absolute alcohol, chloroform and ether. Dose, gr. $\frac{1}{1000}$ every three hours, in children.

Ouabaïn is an extremely active poison, paralyzing the cardiac muscle by direct action. It is a powerful emetic, especially when given hypodermically; also a potent local anæsthetic, being considered by many observers as superior to Cocaine in this respect. In therapeutic doses it does not seem to affect the body-temperature, but increases urination, either by stimulating the blood-pressure or by paralyzing the sphincter vesicæ. It also promotes defecation, probably by stimulating peristalsis. Very small doses give some evidence of action similar to that of Digitalis. It has been used with striking benefit in all stages of pertussis; and to some extent as a local anesthetic for the eye.

STYRAX, **Storax**,—is a balsam prepared from the inner bark of *Liquidambar orientalis*, the Oriental Sweet-gum, a tree of the nat. ord. Hamamelaceæ, growing in Asia Minor. It is semi-liquid, sticky, opaque and gray-colored, of agreeable odor and balsamic taste, completely soluble (except accidental impurities) in an equal weight of warm alcohol. It consists of a volatile oil named *Stryol*, C_8H_8; a crystalline solid *Styracin*, which is a cinnamate of cinnamic ether; two peculiar resins, one hard, the other soft; and *Cinnamic Acid*, $C_9H_8O_2$, a colorless, odorless, crystalline body, closely allied to ic Acid, excreted in the urine partly as Hippuric Acid, and occurring also in the ms of Peru and Tolu. Dose of Storax, gr. v–xx.

Tinctura Benzoini Composita, *Compound Tincture of Benzoin, Friar's Balsam*, contains 8 per cent. of Storax. Dose, ʒ ss–ij.

Storax is a stimulant expectorant, an antiseptic and a disinfectant, acting both locally and remotely, like benzoin and the balsams. It is used with benefit in chronic bronchitis and other affections of the respiratory organs, also in chronic catarrhs of the genito-urinary passages, in gonorrhea and in amenorrhea. Externally it is employed in ointment as a detergent for foul ulcers, and as a parasiticide for scabies and phthiriasis.

SUCCINUM, Amber (Unofficial),—the source of Oil of Amber, is a fossil resin, occurring in alluvial deposits, chiefly in Prussia, Bohemia, and Courland. It is usually associated with lignite, sometimes encloses insects and parts of vegetables, and consists of a volatile oil, a yellow resin, another resin, succinic acid and a bituminous principle. Its source is thought to be an extinct coniferous tree, the *Pinites succinifer*, of which amber represents the exudation. The *Kauri Gum* from New Zealand is a similar substance.

Oleum Succini, *Oil of Amber* (Unofficial),—is a volatile oil obtained by the destructive distillation of Amber, and purified by subsequent rectification; a pale yellow, thin liquid, of sp. gr. about 0.920, of empyreumatic and balsamic odor, warm, acrid taste, and neutral or faintly acid reaction, readily soluble in alcohol. Dose, gtt. v–x.

Oil of Amber is stimulant, antispasmodic and diuretic when used internally. Externally it is irritant and rubefacient. It has been employed with benefit in epilepsy, hysteria, convulsions, amenorrhea, whooping-cough, etc. As a liniment it is often used in chronic rheumatism, and has been applied along the spine in infantile convulsions, mixed with an equal part of laudanum and diluted with olive oil or brandy.

SULPHONAL, Sulphonal, *Diethylsulphon-dimethyl-methane*, $C_7H_{16}S_2O_4$ (Unofficial),—is a synthetical hypnotic which has recently been admitted to an official place in the pharmacopœias of several countries, though unofficial as yet in the United States. It is produced by the interaction of anhydrous *Mercaptan* (ethyl hydrosulphide) and anhydrous *Acetone*, in the presence of a stream of dry HCl. The resulting *Mercaptol* is separated, washed and oxidized by potassium permanganate; yielding Sulphonal in colorless, prismatic crystals, soluble in 15 of boiling water, in about 450 of cold water, and in about 50 of cold alcohol; very soluble in boiling alcohol and in ether. Sulphonal is a very stable body, being unaffected by concentrated acids, alkalies or oxidizing agents, cold or warm. Dose, gr. xv–xxx.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Sulphonal was introduced several years ago as a harmless hypnotic, producing sound and quiet sleep without unpleasant after-effects, without intoxicant or narcotic action, and having no unfavorable effects on the heart or circulation even in full doses. It rapidly came into general use as a hypnotic in mental diseases, in nervous insomnia and in sleeplessness from various causes. Recently a number of competent observers have recorded instances of toxic action following its use, and opinions are now greatly divided as to its therapeutical value. If it were not for the very evident advantage of the drug when used with care and under medical supervision, it would stand a very fair chance of being either excluded from practice or restricted by legislative authority (Squibb). In many cases of serious poisoning thereby death has followed; and its prolonged use may give rise to such minor toxic effects as noises in the ears, headache, vertigo, weakness and incapacity for mental or physical exertion. The patient may next pass into a condition of drowsiness or stupor, or may suffer from difficulty of speech; and ptosis, edema of the eyelids and cyanosis may be experienced. The stopping of the drug in subjects of sulphonism is followed by vertigo, motor disturbances, general weakness, digestive troubles, etc., a condition resembling that in morphinism when the morphine is suddenly cut off (Lépine). In one reported case, a dose of 20 grains nightly for 15 months was accompanied by complete cessation of menstruation. It has produced persistent skin eruptions in some cases and severe functional disturbances in others. The chief characteristics of chronic poisoning by this drug are as follows:—disturbances of digestion, shown by vomiting and diarrhea or constipation; disturbances of the nervous system, as ataxy and feebleness of the limbs, ptosis and ascending paralysis; also ischuria and oliguria, sometimes albuminuria or the presence of hematoporphyrin (Kast). Recovery rapidly follows if the entire alimentary tract be thoroughly purged; and as long as this is kept free and the kidneys act efficiently and normally, the drug may be considered harmless (Fuerst). In order to secure elimination and to guard against cumulative action and consequent toxicity, its administration should be interrupted from time to time. Anorexia, vomiting, or pains in the stomach may be regarded as indications for immediate discontinuance (Kast). In acute poisoning by Sulphonal the treatment is by alkalies freely administered.

As a hypnotic Sulphonal acts admirably in many instances, if administered in hot fluids and about two hours before its action is required; but its efficacy decreases with use, and it is of no value whatever against insomnia due to pain. The average hypnotic dose is about 20 grains for a woman and 30 grains for a man. The dose is to be administered only once daily, and should be discontinued at the first sign of toxic action. In no case should its administration be continued over any great length of time. In cases of insomnia due to neuralgia and nervous excitement, the dose of sulphonal may be advantageously combined with a small dose of morphine, in proportion to suit individual cases, the mixture forming a safe and efficient hypnotic (Gonzales). An excellent hypnotic combination is made by mixing together 10 or 15 grains each of sulphonal and trional, to be taken in some hot liquid at bed-time. The trional producing early sleep and the sulphonal effects being manifested later, the patient will usually obtain a more prolonged result from the small dose of each agent administered together than from a larger dose of either alone.

Trional, *Diethylsulphon-methyl-ethyl-methane*,—differs from Sulphonal only in the substitution of an ethyl for a methyl group. It occurs in lustrous, bitter, tabular crystals, soluble in 320 of cold water, readily soluble in hot water, in alcohol and in ether. It is an efficient hypnotic, prompter in action and less liable to produce ill effects than Sulphonal, but must be given in doses fully as large, gr. xv–xxx. It is said to be peculiarly valuable in cases of slight psychical excitement accompanied by obstinate insomnia, and to act promptly and usefully in many forms of delirium. When pain is present it may be administered in conjunction with phenacetin or acetanilid. A potent objection to its use is the fact that it is patented in this country, which is also true of the following agent.

Tetronal, *Diethylsulphon-diethyl-methane*,—contains 4 ethyl groups to 3 in Trional and but 2 in Sulphonal. Dr. Lauder Brunton holds of the physiological action of the disulphones, to which group these three substances belong, that only those containing ethyl groups are active and that the hypnotic activity is increased with the number of such groups. This, if substantiated in practice, would make Tetronal the most powerful hypnotic of the three. Trional is found to be generally more active however in this respect, and to be freer from unpleasant by-effects, Tetronal producing vomiting and other digestive disturbances in many cases. Neither of them has any value against insomnia due to pain. Dose, gr. xv–xxx, twice or thrice daily.

SULPHUR, and SULPHIDES.—The non-metallic element Sulphur, S, is a brittle solid of a pale yellow color, permanent in the air, of crystalline texture and susceptible of several allotropic states, which are for the most part induced by heat. It is obtained native in several volcanic districts, or from the native Sulphides of Iron and Copper (iron and copper pyrites) by roasting, as it sublimes at about 238° F. It is official in three forms, viz.—

Sulphur Sublimatum, *Sublimed Sulphur*, S,—is prepared from crude Sulphur by sublimation and condensation. It is a fine citron-yellow powder, of faintly acid taste and acid reaction, insoluble in water or alcohol. Ignited it burns with a blue flame, forming sulphurous acid gas, and leaving no residue or only a trace. Dose, gr. x–xx–lx.

Sulphur Lotum, *Washed Sulphur*, S,—prepared by digesting sublimed Sulphur with dilute Water of Ammonia, thoroughly washing with water and passing through a sieve. In this process the Ammonia dissolves out any sulphide of arsenic which may be present and neutralizes any sulphurous or sulphuric acid. [For its solubility and dose see SULPHUR PRÆCIPITATUM below.]

Sulphur Præcipitatum, *Precipitated Sulphur, Lac Sulphuris, Milk of Sulphur*, S,—is prepared by boiling sublimed Sulphur with slaked lime and water, forming the sulphide and hyposulphite of calcium, which are then decomposed by HCl, and Sulphur is precipitated as a very fine powder which is next washed until the washings are tasteless and dried with a gentle heat. The result is a very fine, yellowish-white, amorphous powder, odorless and almost tasteless, insoluble in water or alcohol, but completely soluble in carbon disulphide or in a boiling solution of soda. By heat it is completely volatilized. Dose, gr. x–ʒj.

Preparations of Sulphur.

Unguentum Sulphuris, *Sulphur Ointment,*—has of Sublimed Sulphur 30, Benzoinated Lard 70, rubbed together until thoroughly mixed.

Pulvis Glycyrrhizæ Compositus, *Compound Liquorice Powder* (see under GLYCYRRHIZA),—contains 8 per cent. of Washed Sulphur.

Sulphurous Acid and the **Sulphites** are described under ACIDUM SULPHUROSUM; the **Sulphates** under the titles of their respective bases. For **Sulphuric Acid** see ACIDUM SULPHURICUM.

Sulphides.

Calx Sulphurata, *Sulphurated Lime, Crude Calcium Sulphide,*—is a mixture of CaS, $CaSO_4$ and Carbon, in varying proportions, containing at least 60 per cent. of the first. A pale, gray powder, of offensive taste and smell, and alkaline reaction, insoluble in alcohol, very slightly soluble in water. Dose, gr. $\frac{1}{10}$–$\frac{1}{2}$.

Calcii Sulphidum, *Calcium Sulphide,* CaS (Unofficial),—a constituent of the preceding, is named *Hepar Sulphuris, Liver of Sulphur,* by the homeopathists, who prepare it by mixing equal parts of powdered oyster-shell and sublimed sulphur, and heating at a white heat in a crucible hermetically sealed. Dose, gr. $\frac{1}{10}$–$\frac{1}{2}$.

Potassa Sulphurata, *Sulphurated Potassa, Liver of Sulphur,*—is a mixture of Potassium Trisulphide with small quantities of Potassium Hyposulphite and Potassium Sulphate; prepared by heating together Sublimed Sulphur 1, Potassium Carbonate 2, in a covered crucible until melted. Occurs in irregular pieces of liver-brown color, of disagreeable odor, alkaline reaction and repulsive taste. Soluble in 2 of water, except a small residue. Alcohol dissolves only the potassium sulphide, leaving the other constituents undissolved. Dose, gr. ij–x, in pill or solution.

Sulphuris Iodidum, *Sulphur Iodide, Iodine Disulphide,* I_2S_2,—is prepared by fusing together Washed Sulphur 1 part and Iodine 4. It is a grayish-black crystalline solid, having the odor of iodine, an acrid taste and a faintly acid reaction, insoluble in water, but very soluble in disulphide of carbon and in about 60 of glycerin. Alcohol and ether dissolve out the iodine, leaving the sulphur. Used only as ointment, gr. xxx to the ℥.

Hydrogenii Sulphidum, *Hydrogen Sulphide, Sulphuretted Hydrogen,* H_2S,—is used only for test purposes; a saturated, aqueous solution being one of the official reagents. It is a colorless gas, having the odor of rotten eggs, prepared by the action of dilute sulphuric acid on iron sulphide; the gas being passed into water a solution is obtained. It precipitates most of the metals from acid solutions as sulphides; that with Arsenic being yellow; with Antimony, orange; with Cadmium, yellow; with Copper, Lead, Mercury and Silver, black; with Bismuth, brown; with Gold and Platinum, brownish-black.

Carbon Disulphide is described under CARBO; **Antimony Sulphide** and **Sulphurated Antimony** under ANTIMONIUM.

Unofficial Allied Compounds.

Ichthyolum, *Ichthyol, Ammonium Sulpho-ichthyolate,* $C_{28}H_{36}S_3O_6(NH_4)_2$,—is prepared from the product of the distillation of bituminous rocks from the Tyrol which contain fossil fishes. It occurs as a viscous, reddish-brown mass, of tarry odor and appearance and feebly alkaline reaction; soluble in water and in a mixture of alcohol and ether; mixes in all proportions with glycerin, fats and oils. It contains a large proportion of Sulphur, about 10 per cent. Dose, internally, gr. v–xxx.

Sulpho-ichthyolates of Lithium, Sodium and Zinc are also prepared, and are on the market.

Thiolum, *Thiol,*—is prepared by the sulphuration of certain non-saturated hydrocarbons, and is a product very similar to Ichthyol. It occurs in both dry and liquid form, the former, *Thiolum siccum,* as dark-brown lamellæ or powder, of bituminous odor and bitter, astringent taste; soluble in water and in chloroform, sparingly in alcohol, insoluble in ether and in benzin. The liquid form, *Thiolum liquidum,* is a dark-colored, syrupy fluid, miscible in all proportions with water. Dose, internally, gr. v–xxx.

Tumenolum, *Tumenol,*—is obtained by treating the unsaturated hydrocarbons of mineral oils with concentrated sulphuric acid. It occurs in several forms, solid and known as *Commercial Tumenol* being considered the most generally useful. -brown fluid, which can be employed in ointment and in tincture, externally.

PHYSIOLOGICAL ACTION.

r is a mild laxative and a diaphoretic. In contact with living m it enters into combination and produces either sulphuretted or sulphurous acid; taken into the intestinal canal a large pores out unchanged, some of it being converted by the alkaline sulphuretted hydrogen and sulphides. The former is excreted ngs, giving to the breath the smell of rotten eggs, also by the coloring silver articles carried about the person by forming a of silver. The Sulphides are partly absorbed into the blood and ted in the urine, chiefly as sulphates, and in the feces, which ken and render soft. Given in full doses they are irritant to the and intestines, extremely nauseous to the taste and smell, increase tions of the intestinal glands, promote peristaltic action, and if any length of time they impair the blood, causing anemia, n, tremor and great debility.

retted Hydrogen is very destructive to plant life. In animals it the tissue functions, decomposing the blood and paralyzing the nd muscular systems. The symptoms of poisoning are those of ; muscular tremors occur and are followed by convulsions and This gas is often found in cesspools in large quantities, but in poisoning occurred from its excessive formation in the intestines equent absorption into the blood.

Sulphurata and Potassa Sulphurata act like the sulphides as local and in large doses as irritant poisons, producing narcotic symp- convulsions. In small doses they act like sulphur, and are by many observers to have a special influence on suppuration, or preventing it if given in small doses frequently repeated.

odide is believed to possess some of the properties of both its . It is doubtful whether it is a distinct chemical compound or physical mixture. As a parasiticide it is very efficient, and has nd remarkably alterative in many local affections of chronic r, but may prove very irritant to the skin if improperly prepared.

tions of Sulphuric Acid, of Sulphurous Acid and of the Sulphites ctively described under the titles ACIDUM SULPHURICUM and SULPHUROSUM.

Incompatibles and Antidotes.

s of the Sulphides are decomposed by the mineral acids and by solutions of lts. Antidotes are Chlorine-water, Chlorides of Sodium and Potassium, Sul- ron, etc. Poisoning by Sulphuretted Hydrogen is best treated by artificial

THERAPEUTICS.

Sulphur is chiefly used as a laxative when pultaceous rather than liquid stools are required, as in hemorrhoids and anal fissure, also in constipation. Scabies has long been treated by its local and internal use, but sulphur alone does not kill the itch insect. The older sulphur ointments were made with sublimed sulphur, and probably contained a considerable amount of sulphurous acid on which their parasiticide property depended. The later ointments, made with purified sulphur, all contain an alkaline ingredient and develop sulphides, which are powerful insect poisons. Sulphur fumigations are practically applications of volatile sulphurous acid, while most of the sulphur baths and sulphurous mineral waters are solutions of sulphuretted hydrogen or of the alkaline sulphides. They are of value in lead poisoning to favor the elimination of that metal, in chronic constipation, chronic rheumatism and sciatica and many skin diseases, especially chronic psoriasis, eczema, pityriasis and prurigo. The Ointment and the Alkaline Ointment are both used in scabies.

The Iodide has been used internally in scrofula, glanders and cutaneous disorders, but it is chiefly employed as an ointment in lupus and parasitic skin diseases, especially herpes circinatus. Calx Sulphurata is extremely efficient as an internal remedy in crops of boils, scrofulous sores, glandular enlargements, acne, etc., and will prevent or limit suppuration. For these purposes it must be used in small doses (gr. $\frac{1}{10}$) frequently repeated. Potassa Sulphurata is only used externally as baths or ointment in skin diseases and mucous discharges, also in chronic rheumatism.

Ichthyol was introduced several years ago, by Dr. Unna, the celebrated dermatologist, as a promptly efficient remedy in certain chronic skin diseases, particularly eczema and psoriasis. It mixes with vaselin, lard and oils, is soluble in a mixture of ether and alcohol, and is not irritant locally, even if covered with oiled silk.

In one case of eczema infantile, an ointment was applied containing 1 part of Ichthyol to 5 of Vaselin, resulting in the child sinking into a stupor which lasted for 12 hours. A fatal case of poisoning thereby is reported by Bergerio, of Turin, in a woman whose uterus had been curetted the day previous. After the washing out of the uterine cavity with a solution of Ichthyol 33 to Glycerin 66, she complained of a putrid fish taste in her mouth, her pulse became like that in tachycardia and symptoms of general depression rapidly supervened, ending in death after about 12 hours. These instances show that this agent is not devoid of danger, and that care must be exercised in its employment.

The particular value of Ichthyol, as a local remedy, is due to its non-irritant quality and to the large proportion of sulphur contained therein; which in any pharmaceutical combination would excite a dermatitis. Its application in medicine depends chiefly upon its reducing property, its antiseptic power and its contractile action upon the vascular system. Most of the affections for which it has been recommended are caused by anomalous circulation and especially capillary dilatation. Used internally, it retards the disintegration of albumins and favors their formation and accumulation. Upon exudations it has a remarkable effect, given internally at the same time as applied externally, promoting their reabsorption and promptly alleviating pain. For these purposes it has been highly praised in gynecology and even in pleurisy. For chronic rheumatism a 50 per cent. ointment is used locally and the remedy is also given internally. It has done excellent service in erysipelas and in ulcers of the leg, locally applied in ointment form with Lanolin or pure; and internally in various affections of the digestive and intestinal tract, also in phthisis, syphilis and leprosy. In gynecology it is combined with glycerin (1 in 10); it is used with turpentine as a liniment for rheumatism, or with an equal weight of a mixture of lanolin and olive oil and 30 per cent. of chloroform; and against erysipelas as a 10 to 20 per cent. collodion, with or without castor oil.

Thiol, the German artificial Ichthyol, is largely used in place of Ichthyol by gynecologists and dermatologists. It causes no pain, burning, or other irritation, and no bleeding from eroded surfaces; promotes rapid absorption of effusions, and has many advantages over the natural Ichthyol, among which is the ease with which the stains it produces on linen may be removed. The dry form, used as a dusting powder, is of especial service in erysipelas and is employed with benefit in eczema, erythema, intertrigo, impetigo, pemphigus and other cutaneous affections; especially in acute, moist inflammations of the skin and subjacent tissues, in chilblains, periphlebitis, contusions, subcutaneous hemorrhages and syphilitic ulcers. It is also an efficient application in pelvic exudations and endometritis. It may be applied as a powder or collodion, also in aqueous or glycerin solutions, as ointment, soap, plaster, etc. Internally, it is given in wine or chocolate (1 to 2 per cent.), also in pills containing a grain each. Mixed with Talc, in the proportion of 10 to 20 per cent., it makes an excellent dusting powder for use on babies' skin.

Tumenol is said to owe its therapeutic action to its powerful reducing property rather than to the sulphur in its composition. The tincture has been almost universally successful in all forms of pruritus. Moist eczema is especially benefited by it, and it generally gives good results when employed in erosions, excoriations and superficial ulcerations. It is not anti-parasitic in action and is of no service in erysipelas.

SUMBUL,—is the root of *Ferula Sumbul*, a very large plant of the nat. ord. Umbelliferæ, which grows to the height of 8 feet in Northern Asia. The root contains *Angelic Acid*, $C_5H_8O_2$, *Valerianic Acid*, $C_5H_{10}O_2$, also a volatile oil, two balsamic resins, a bitter substance, etc. Dose, gr. xxx–ʒj or more, in infusion or decoction.

Tinctura Sumbul, *Tincture of Sumbul*,—10 per cent. Dose, ʒj–iv.

Sumbul is an efficient nerve tonic, having qualities closely resembling musk and valerian. It is used by the Russian physicians in very many morbid conditions and seems to be a favorite remedy in that country for almost any disease. It is probably of some value in hysteria and other nervous derangements of delicate females, and may be used as a substitute for musk in typhoid conditions and fevers, asthma, delirium tremens and perhaps in epilepsy.

TABACUM, Tobacco,—is the commercial dried leaf of *Nicotiana Tabacum*, an annual plant of the nat. ord. Solanaceæ, native of tropical America, but cultivated in several parts of the world, especially in Cuba and Virginia. The leaves contain a very poisonous, oily fluid alkaloid named *Nicotine*, $C_{10}H_{14}N_2$, which occurs as a malate and in quantity varies greatly in different specimens. Tobacco contains also a volatilizable, camphoraceous principle named *Nicotianin*, the existence of which is denied by some analysts, besides potassium and calcium salts (nitrates and phosphates), silica, gum, resin and other substances. There are no official preparations.

Nicotina, *Nicotine*, $C_{10}H_{14}N_2$ (Unofficial),—the alkaloid and active principle; a colorless, oily fluid, having the odor of tobacco and an acrid taste; readily soluble in water, and forming soluble salts with acids. Dose, ♏ $\frac{1}{20}$–$\frac{1}{10}$, up to ♏ ij in two hours, in tetanus and in strychnine poisoning. [Other *Liquid Alkaloids* besides Nicotine are—Coniïne, Lobeline, Lupuline, Muscarine, Piperidine, Pyridine, Sparteine and the alkaloidal compound Trimethylamine.]

The proportion of Nicotine in tobacco is stated at 6 in 10,000 parts (0.06 per cent.) by Posselt and Reimann, but other analysts have found 2 per cent. in Havana tobacco and more than 8 per cent. in French tobacco. Turkish tobacco is said to contain little or none. The effect of curing undoubtedly produces chemical changes, but chemists differ as to whether the proportion of nicotine is greater or less after that process.

According to Zeise (1843) and Vohl and Eulenberg (1872), tobacco-smoke contains no nicotine, but does contain a series of empyreumatic products, the result probably of its decomposition, viz.—pyridine, collidine, picoline, parvoline, etc. Of these, *Pyridine*, C_5H_5N, predominates when tobacco is smoked in a pipe, but *Collidine*, $C_8H_{11}N$, which is far less active, predominates when there is free access of air as in smoking cigars. Tobacco-smoke also contains *Carbon Dioxide*, CO_2, of which Krause determines the average proportion to be 9.3 per cent., and to which he credits much of the injurious effects of smoking in young subjects. It also contains creosote, hydrogen cyanide and sulphide gases, also several acids, including acetic, carbolic and valerianic.

Unofficial Preparations and Salts, etc.

Enema Tabaci, *Enema of Tobacco* (B. P. 1867),—gr. xx of the leaf infused in ℥ viij of boiling water for an hour, strained, and the whole administered as one enema.

Oleum Tabaci, *Oil of Tobacco*,—is an empyreumatic product and a most virulent poison, obtained by distillation at a temperature above that of boiling water.

Vinum Tabaci, *Wine of Tobacco*,—℥j to the pint. Dose, ♏v–ʒj.

Pyridina, *Pyridine*, C_5H_5N,—a colorless, liquid alkaloid, of powerful odor, evaporating when exposed to air and mixing with water in all proportions. Dose, ʒj–ʒjss, allowed to evaporate in an open dish in a small room, in which the patient is exposed for 20 to 30 minutes thrice daily for the relief of asthma (Sée).

Nicotinæ Bitartras, *Nicotine Bitartrate*,—occurs in fine, white crystals, having a tendency to aggregate, readily soluble in water. This salt is stable and keeps well, even in solution. It is recommended as the most suitable form of administering nicotine in tetanus, strychnine poisoning, etc. Dose, gr. $\frac{1}{20}$–$\frac{1}{10}$, up to a maximum of gr. ij in 2 hours.

PHYSIOLOGICAL ACTION.

Tobacco is a very depressant nauseant, an emetic by irritant as well as by systemic action and an antispasmodic; also sternutatory, diuretic, dia- [illegible] cathartic, sedative and narcotic. It first stimulates and after- [illegible]zes the motor nerves of involuntary muscles and the secreting [illegible]nds, also the spinal cord and the vagus; at first stimulating both the vagus-roots and its ends in the heart (slowing the pulse-rate), but afterwards paralyzing the latter (causing high pulse-rate). It increases the salivary and intestinal secretions and produces diuresis, tremor, clonic spasms and a tetanic stage followed by paresis. It contracts the pupils, slows and depresses the heart, lowers arterial tension at first and afterwards raises it, reduces the body-temperature and causes profuse sweating, cold and clammy skin, collapse and death usually by paralysis of respiration, sometimes by paralysis of the heart. It does not impair the muscular irritability, nor does it act upon the cerebrum directly. Its empyreumatic products act similarly but less powerfully. Fatal results have followed the inhalation of its vapor into the lungs.

The continued use of Tobacco, by smoking or chewing it to excess, produces granular inflammation of the fauces and pharynx, atrophy of the retina, dyspepsia, lowered sexual power, sudden faints, nervous depression, cardiac irritability and occasionally angina pectoris. Used by the young it hinders the development of the higher nerve centres and impairs the nutrition of the body by interfering with the processes of digestion and assimilation. It has been credited with causing cancer of the lips and tongue, blunting of the moral sense, mental aberration and even insanity. The so-called "tobacco heart" includes many forms of nervous, painful or oppressed cardiac action, depending on the age of the subject, the quantity consumed and other circumstances. In mild cases an occasional palpitation or flutter is complained of; in more severe ones there is considerable cardiac irregularity and rapidity, and more or less distress experienced; in some there is actual cardiac pain, decided irregularity and occasional intermittence of action, and the symptoms may simulate those of a case of angina pectoris. There are no physical signs as a rule, so that the diagnosis is made by exclusion. The pathology is unknown, but probably involves some lesion of the vagus. In the young, excessive indulgence in tobacco may lead to cardiac hypertrophy, dilatation and even valvular lesions (Osler).

Nicotine, in even minute doses (gr. $\frac{1}{7}$), causes symptoms of intense gastric irritation with an extreme degree of collapse. It abolishes the function of the motor nerves and paralyzes respiration. Its general action is that of tobacco, but it is one of the most powerful and rapidly-acting poisons known, death having occurred within three minutes after its ingestion, the patient dropping instantly to the floor insensible, with no symptoms except a wild stare and a deep sigh. The $\frac{1}{15}$ of a grain has caused death in a human being, and $\frac{1}{32}$ is fatal to cats and dogs.

Antidotes and Antagonists.

Strychnine is the true physiological antagonist to Nicotine (or Tobacco) and *vice versâ*. Alcohol, Ammonia, Ergot, Digitalis, Belladonna, etc., antagonize its action on the circulation. In poisoning by Tobacco the means resorted to are evacuation of the stomach, Tannin, Iodides, and artificial respiration. A curious synergism has been observed by the author between Opium and Tobacco. If a person habituated to the use of the latter, either by smoking or chewing, begins to use Morphine, the smallest quantity of Tobacco will make him sick, the symptoms being those experienced by a novice in its use. For the depression due to excessive smoking, the best agent is Spiritus Ætheris Compositus (Hoffman's Anodyne).

THERAPEUTICS.

Tobacco is now but little used in medicine, the dangers attending its employment either internally or externally having caused it to be superseded by less violently acting agents. The principal objects for which it is employed are to relax spasm of the intestines and to relieve local pain therein. Intestinal affections, like impaction of the cecum, intussusception and strangulated hernia, may be overcome by a tobacco-enema to relax spasm, but it is a dangerous expedient. In dropsy, especially the renal form, it makes a very efficient diuretic. In tetanus there is no more effective remedy than minim doses of the alkaloid every two hours by the stomach, or ♏ij by the rectum, or better still the wine in 10 minim doses repeated for effect. Strychnine-poisoning is best met by minute doses of Nicotine, gr. $\frac{1}{24}$ hypodermically, as a physiological antagonist. It may be employed with advantage in habitual constipation, for the dyspnea of spasmodic asthma and emphysema, also in nymphomania and chordee. In all forms of asthma the inhalation of the fumes of Pyridine is beneficial, as it has a powerfully sedative action on the respiratory centre. The use of Tobacco in moderation, when under excessive exertion, aids in supporting the system and lessening the sense of fatigue. Smokers rarely suffer from constipation, but generally experience an immediate laxative result from their morning cigar.

TAMARINDUS, **Tamarind**,—is the preserved pulp of the fruit of *Tamarindus indica*, a large tree of the nat. ord. Leguminosæ, native in the East and West Indies. It contains citric, tartaric and malic acids, sugar, gum, potassium bitartrate, etc.

Confectio Sennæ, *Confection of Senna*,—contains Tamarind to the amount of 10 per cent. Dose, ʒj–ij. (See under SENNA.)

Tamarind is a laxative and refrigerant fruit. In infusion it may be used by convalescents as a pleasant acidulous drink, or the pulp may be boiled with milk as a whey for the same purpose. As a laxative it is usually prescribed in connection with other agents having the same action.

TANACETUM, **Tansy**,—the leaves and tops of *Tanacetum vulgare*, a perennial, herbaceous plant of the nat. ord. Compositæ, indigenous in Europe but cultivated in our gardens and growing wild in old fields. It contains a volatile oil, a bitter principle *Tanacetin*, a tannic acid, etc. There are no official preparations, but a fluid extract may be prepared according to the general rule and administered in doses of ♏x–ʒj. The dose of the volatile oil (Oleum Tanaceti) is 1 to 3 drops. An infusion (Tansy Tea) may be made in the proportion of ℥j to the pint, and used in doses of ℥j–ij.

Tansy is emmenagogue, diuretic and anthelmintic, an aromatic bitter and an irritant narcotic poison. Fatal results have followed upon overdoses of the oil (℥ss–j) [illegible] strong [illegible]ns, preceded by clonic spasms, disturbed respiration and cessation of the heart's [illegible] is a useful remedy in amenorrhea, but is in popular repute as an abortifacient, [illegible]ch it does not possess except in quantity dangerous to life.

TARAXACUM, Dandelion,—is the root of *Taraxacum officinale*, a plant of the nat. ord. Compositæ. All parts of the plant contain a bitter, milky juice, exuding from any break or wound. Its constituents are a bitter amorphous principle named *Taraxacin*, a crystalline principle *Taraxacerin*, with potassium and calcium salts, Inulin, and resinoid bodies, etc. The French name for the plant is "Pissenlit."

Extractum Taraxaci, *Extract of Taraxacum*.—Dose, gr. v–xxx.

Extractum Taraxaci Fluidum, *Fluid Extract of Taraxacum*.—Dose, ʒj–℥j.

Taraxacum is a bitter tonic, a diuretic and an aperient. It has been supposed to act especially on the liver and is chiefly used in dyspepsia with hepatic torpor. As found in the shops it is usually inert. The extract is of value as an excipient for pills.

TEREBINTHINA, Turpentine.—A Turpentine means a vegetable exudation, liquid or concrete, consisting of resin combined with a peculiar essential oil named *Oil of Turpentine* ($C_{10}H_{16}$), and generally procured from various species of the nat. ord. Coniferæ (cone-bearers). Of the many turpentines two only are official, viz.—

Terebinthina, *Turpentine*,—a concrete oleoresin from *Pinus palustris* the Yellow Pine and other species of *Pinus*, nat. ord. Coniferæ. Occurs in tough, yellowish masses, brittle when cold, crummy-crystalline interiorly, of terebinthinate odor and taste. Dose, gr. v–xxx as a stimulant, antispasmodic or diuretic; ʒij–iv as an anthelmintic.

Terebinthina Canadensis, *Canada Turpentine, Balsam of Fir*,—a liquid oleoresin obtained from *Abies balsamea*, the Silver Fir or Balm of Gilead, nat. ord. Coniferæ. A yellowish, transparent, viscid liquid, of agreeable, terebinthinate odor and a bitterish and slightly acrid taste, slowly drying on exposure, forming a transparent mass; completely soluble in ether, chloroform or benzol. Dose, gr. x–xxx.

Pitch and its preparations are described under the title PIX.

Unofficial Turpentines.

Chian Turpentine,—from the *Pistacea Terebinthus*, a small larch tree growing in the islands of Chio and Cyprus; a thick, tenacious, greenish-yellow liquid, concreting on exposure to the air into a translucent solid. Dose, gr. iij–v in emulsion.

Venice Turpentine,—procured in Switzerland from the *Larix Europæa* or European Larch; a viscid liquid of the consistence of honey, does not concrete on exposure, and is entirely soluble in alcohol. The Venice Turpentine of commerce is usually prepared by dissolving resin in oil of turpentine.

Thus Americanum, *Common Frankincense* (B. P.),—the concrete turpentine scraped off the trunks of *Pinus australis* and *Pinus Tæda*. An ingredient of the Emplastrum Picis of the Br. Phar.

Official Preparations of Turpentine.

Oleum Terebinthinæ, *Oil of Turpentine*, commonly called Spirit or Spirits of Turpentine,—is a volatile oil distilled from Turpentine. A thin, colorless liquid, of characteristic odor and taste; soluble in 3 times its volume of alcohol, mixes with other volatile and fixed oils, and dissolves resins, wax, sulphur, phosphorus and iodine. Bromine and powdered Iodine act violently on it, and when brought into contact with a mixture of Nitric and Sulphuric Acids it takes fire. It is isomeric with a number of volatile oils, has the formula $C_{10}H_{16}$—but constantly absorbs oxygen from the air when exposed, becoming thicker and less active from formation of resin. It is a mixture of several hydrocarbons, each having the same formula as itself, viz., $C_{10}H_{16}$.

Oleum Terebinthinæ Rectificatum, *Rectified Oil of Turpentine,*—prepared by shaking Oil of Turpentine with 6 times its volume of Lime Water, distilling three-fourths, and separating. This preparation should always be dispensed when Oil of Turpentine is required for internal use. Dose, as a stimulant or diuretic, ♏v–xv in emulsion 3 to 6 times daily;—as a cathartic or anthelmintic ℥ss or more, combined with other cathartics. A little glycerin and oil of gaultheria will disguise the taste.

Linimentum Terebinthinæ, *Turpentine Liniment,*—has 35 parts of the Oil of Turpentine with 65 of Resin Cerate.

Linimentum Terebinthinæ Aceticum, *Liniment of Turpentine and Acetic Acid* (Br. Ph.),—has of the Oil of Turpentine 4, Glacial Acetic Acid 1, Liniment of Camphor 4. An imitation of St. John Long's celebrated liniment.

Derivatives of Turpentine.

Resina, *Resin, Colophony,*—is the residue left after distilling off the volatile oil from turpentine; the portion of turpentine which is fixed by oxidation, consisting in greater part of *Abietic anhydride* ($C_{44}H_{62}O_4$). See *ante*, under its own title.

Terebenum, *Terebene,* $C_{10}H_{16}$,—is a hydrocarbon obtained by the oxidation of Oil of Turpentine by strong Sulphuric Acid, and occurs as a colorless, or light yellow liquid, with the pleasant odor of newly cut pine wood; practically insoluble in water, soluble in an equal volume of alcohol. It consists chiefly of *Pinene*, and should contain not more than very small proportions of Terpinene and Dipentene (U. S. P.); [consists of Camphene, Cymene, Borneol and Terpilene (Squibb)]. Dose, ♏v–xx on sugar, or suspended in ℥ss of water by the aid of gr. xx of light magnesium carbonate.

Terpini Hydras, *Terpin Hydrate,* $C_{10}H_{18}(OH)_2.H_2O$,—is the hydrate of the diatomic alcohol Terpin (Terebinthene), obtained by distilling oil of Turpentine with an alkali. Colorless, lustrous, rhombic prisms, nearly odorless, of slightly aromatic and somewhat bitter taste; soluble in 10 of alcohol and in about 250 of water at 59° F., in 32 of boiling water and in 2 of boiling alcohol. Dose, gr. j–x.

Terpinol (Unofficial),—an oily body obtained from the preceding by the action of an acid thereon. Dose, gr. ij–v.

Sanitas Disinfecting Fluid (Unofficial),—is an aqueous solution of turpentine which has been oxidized by exposure to the air. It contains Hydrogen Dioxide, Thymol, Camphor and Camphoric Acid, the latter in such small proportion, however, that its action cannot be expected. This proprietary preparation has many advantages. It is a good oxidizing agent and antiseptic, is not poisonous and does not stain the linen; qualities which recommend it as a disinfectant and for use in surgical operations.

Official Analogues of Turpentine.

These include JUNIPERUS *Juniper*, SABINA *Savine*, PIX *Pitch*, and PIX LIQUIDA *Tar*, which are described under their respective titles.

Unofficial Analogues of Turpentine.

Oleum Succini, *Oil of Amber,*—a volatile oil obtained by the destructive distillation of Amber (Succinum), a fossil resin thought to be the exudation of *Pinites succinifer*, an extinct coniferous tree. Dose, gtt. v–x. See *ante*, under SUCCINUM.

Oleum Thujæ, *Oil of Thuja,*—a volatile oil which is given in doses of ♏j–v. A saturated tincture may be used in drachm doses. Obtained from *Thuja occidentalis*, the Arbor Vitæ, a coniferous tree. See under THUJA.

Oleum Pini Sylvestris, *Oil of Scotch Fir* (B. P.),—a colorless liquid, obtained by distilling the fresh leaves of *Pinus sylvestris*, used externally and by inhalation. [See page 431.]

PHYSIOLOGICAL ACTION.

Turpentines are stimulant, diuretic, anthelmintic, and hemostatic; in large doses laxative and irritant, and externally used are rubefacient and antiseptic. Their virtues depend entirely on the volatile oil.

Oil of Turpentine in small doses causes a sense of heat at the epigastrium, burning in the mouth and salivation by reflex action. In moderate doses it at first stimulates the vaso-motor nervous system, afterwards paralyzing these centres, thus causing a rise and then a fall of the arterial tension. It lowers the functions of the brain, spinal cord and medulla in the order stated, causing diminution of voluntary movement and reflex action, dilatation of the vessels, lowered blood-pressure and slowed respiration, the latter often becoming spasmodic. The pulse is sometimes slowed, sometimes quickened. Large doses produce gastro-enteritis, with vomiting and diarrhea, suppression of urine, pain in the lumbar regions, burning in the urethra, hematuria and strangury. The muscular power is diminished, coördination impaired and a state of intoxication induced. In toxic dose it acts as a narcotic poison and causes complete muscular relaxation, profound insensibility with abolished reflexes, dilated pupils, cyanosed face, labored and stertorous breathing and death by paralysis of respiration. It is excreted by the various organs of excretion, all of which are highly irritated, the kidneys suffering particularly. Its vapor inhaled produces nasal and renal irritation, frontal headache, also frequently strangury and hematuria. Locally to the skin it is rubefacient and even vesicant if applied for any length of time or if evaporation be prevented.

The Oil, when exposed to the air, readily absorbs oxygen in the form of ozone, which it retains tenaciously. This ozonized oil of turpentine is an antidote to phosphorus, preventing the formation of phosphoric acid and converting the phosphorus into an insoluble substance resembling spermaceti. Worn about the neck in an open vial it is believed to prevent necrosis of the jaw and steatosis of the organs in workmen exposed to phosphorus-fumes. It is supposed to dissolve gall-stones.

Antidotes and Antagonists.

In cases of poisoning the stomach should be emptied, anodynes and demulcents administered, elimination favored, and special symptoms met as they arise.

THERAPEUTICS.

The Oil of Turpentine is employed externally as a rubefacient and counter-irritant in many conditions producing pain and inflammation. Cloths wrung out of hot water and then sprinkled with the oil (turpentine stupes) are useful applications in sciatica and other neuralgiæ, lumbago, chronic rheumatism, chronic bronchitis, peritonitis with tympanites, pleurisy, renal colic, etc. It is one of the most efficient agents in hospital gangrene, applied in full strength to the part affected. The liniment is in constant use for sprains, neuralgia and other slight local affections.

Internally it is best employed in ulceration and hemorrhage of the intestines and in passive hemorrhages from other organs. Active bleeding with a plethoric condition and hematuria are states in which it is contraindicated. It is often used with ether (1 to 3) in biliary and flatulent colic as an anodyne and antispasmodic. As a vermifuge against tape-worm it must be employed in large doses (℥ss–ij) with castor oil to promote its rapid passage through the intestinal canal. The French acid oil, which is old and contains ozone, is used in phosphorus poisoning. It is well employed as a stimulant to the heart and vaso-motor system in puerperal fever, yellow fever, traumatic erysipelas, pneumonia, capillary bronchitis, etc. It is also useful in chronic bronchial catarrh, chronic cystitis, subacute gonorrhea and similar affections of the mucous surfaces generally. Inhalations of the vapor or atomized oil are beneficial in chronic affections of the larynx and bronchi. The pure vapor is too irritant for inhalation but it may be diluted with steam from an atomizer. Chian Turpentine is one of the remedies which have been used for cancer.

Terebene has been extensively used by Murrell, with excellent results, as a remedy for obstinate winter-cough and emphysema of the lungs, in flatulence and flatulent dyspepsia, in cystitis and gleet, and as a spray in phthisis and post-nasal catarrh, also with cocaine with solution as a spray for coryza and hay-fever. Other observers, of several years' experience with this remedy, praise it highly as an inhalant remedy in phthisis, bronchiectasis, chronic bronchitis and other pulmonary affections characterized by profuse, purulent expectoration. Rieu employs it extensively in bronchitis and bronchorrhea, in doses internally of gr. xv–xxx per diem, but says that it does not affect the muco-purulent expectoration of phthisis. It probably has no superior efficacy to creosote, Venice turpentine, etc., except that it is without much odor and has no taste.

Terpin Hydrate is praised very highly in chronic and recurrent bronchitis, night-cough from habit, catarrhs and kindred affections. In fact, all acute and many chronic affections of the respiratory passages form the proper field for the therapeutical action of this preparation.

THEOBROMATIS OLEUM, Oil of Theobroma, *Cacao-butter*,—is a *fixed* oil expressed from the seed of *Theobroma Cacao*, the Chocolate-tree, nat. ord. Sterculiaceæ, growing in Mexico, the West Indies and South America. The oil is a yellowish-white solid, of faint odor, bland taste and neutral reaction. The seeds are oval, about the size of almonds, and consist of shells and kernels, in both of which is found the alkaloid *Theobromine*, $C_7H_8N_4O_2$, which closely resembles Caffeine, the latter being its methyl derivative. *Chocolate* is prepared by roasting the seeds, removing the shells, then crushing or grinding the kernels to a smooth paste, which is cast in molds.

Oil of Theobroma consists chiefly of Stearin with a little Olein. Its action is demulcent, and it does not become rancid on exposure to the air. Its chief use is as a basis for making suppositories. A Cerate is prepared by melting together Cacao-butter 35, White Wax 35, Oil of Almond 30, adding a drop of Oil of Rose and coloring with a minute quantity of Carmine previously triturated with a drop of Water of Ammonia. This is known as *Red Lip-salve.*

Theobromine has the same action and uses as Caffeine. [See under CAFFEA, for this principle and for Diuretin.]

THUJA, Arbor Vitæ (Unofficial),—the fresh tops of *Thuja occidentalis*, a tree of the nat. ord. Coniferæ, commonly though incorrectly called White Cedar, growing in swampy ground in Canada and in the northern U. S. They contain a volatile oil, tannin, wax, resin, etc.; also *Pinipicrin* a bitter principle, and *Thujin* a yellow, astringent and crystallizable coloring principle, which is separable into glucose and *Thujetin.*

The dose of a saturated, fresh tincture or fluid extract is ʒj, 3 to 6 times daily. The Volatile Oil may be given in doses of ♏j–v.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Thuja resembles Savine in action very closely. It is stimulant, irritant and astringent, also aromatic, diuretic and emmenagogue. The oil is a gastro-intestinal irritant and produces epileptiform convulsions in warm-blooded animals but paralysis in cold-blooded ones. It causes rhythmical contraction and dilatation of the vessels, lowers the temperature and is anthelmintic. Thuja is indirectly an abortifacient when given in doses sufficient to cause violent gastro-enteritis. It is reported to have produced an acute urethritis resembling gonorrhea.

Thuja in decoction has been usefully employed in coughs, rheumatic and arthritic pains, dropsy and amenorrhea. It has been given with benefit in intermittent fever and as an alterative blennorrhetic in chronic catarrh and bronchorrhea. It is highly praised by Phillips for the cure of warts with narrow base and pendulous body, a strong tincture being applied locally and given internally at the same time in 5-minim doses twice daily. Piffard speaks strongly in its favor as a valuable agent for non-syphilitic warts (condylomata acuminata) of the penis and vulva, for papillomatous growths in general and for gleet dependent on granular urethritis. It has been used in chronic gonorrhea and prostatitis with asserted success, and is said to have cured epithelioma. The oil has been employed as a vermifuge.

THYMI OLEUM, Oil of Thyme,—is a volatile oil distilled from *Thymus vulgaris*, the Garden Thyme, a common shrub of the nat. ord. Labiatæ, indigenous to France but cultivated in our gardens. This oil is pale yellow or colorless, thin liquid, having a strong odor of thyme, a warm, pungent and afterwards cooling taste and a neutral reaction;

readily soluble in alcohol. It consists of two portions, the more volatile being a mixture of the hydrocarbons *Cymene* and *Thymene*, the less volatile being chiefly *Thymol*, which is official.

Thymol, $C_{10}H_{14}O$,—is a phenol contained in Oil of Thyme and in the volatile oils of several other plants. It occurs in large, colorless, hexagonal crystals, of aromatic odor, pungent taste and neutral reaction; soluble in 1200 of water, in 900 of boiling water, in 1 of alcohol, freely in fats and oils, solutions of chloral and alkalies, ether, chloroform, etc. It liquefies when triturated with about equal quantities of camphor, menthol or chloral. Dose, gr. ss–ij.

Unofficial Preparations.

Thymol Solution,—for antiseptic spray, 1 part in 1000.

Thymol Ointments,—vary in strength from 5 to 30 grains to the ℥.

Thymol Inhalation,—Thymol gr. xx, Alcohol ʒiij, Magnesium Carbonate gr. x, Water to ℥iij. A teaspoonful to a pint of water at 150° F. for each inhalation.

Volkmann's Antiseptic Fluid,—has of Thymol 1, Alcohol 10, Glycerin 20 and Water 100 parts.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Oil of Thyme has the same properties as the oils of other mints, and containing a large quantity of Thymol it is similar to the latter in action.

Thymol in its action stands between carbolic acid and oil of turpentine. Like the former it is a powerful antiseptic and disinfectant, also a local irritant and anesthetic to the skin and mucous membranes, paralyzing the end-organs of the sensory nerves. When absorbed it paralyzes the nerve-centres in the spinal cord and in the medulla, lessening reflex action, slowing respiration, lowering the temperature and the arterial tension, and in poisonous doses causing weakness, coma and death. Internally administered in doses of 20 to 30 grains per diem it produces a sensation of epigastric heat, sweating, singing in the ears, deafness, a sense of constriction in the forehead and increase of the urinary discharge, which assumes a dark greenish hue. It is eliminated by the respiratory and urinary organs, which it irritates considerably during the process of its excretion. As an antiseptic it is much more powerful and permanent than carbolic acid, and much less poisonous.

Thymol is chiefly employed in lieu of carbolic acid as an antiseptic for dressing wounds; as a gargle, spray or inhalation in laryngitis and diphtheria; as an ointment in ringworm, eczema and psoriasis, and as an injection in ozena. A solution of 1 part in 1000 is the strength usually employed. Internally it has been used with success in diphtheria, typhoid fever and other intestinal affections, diabetes, phthisis and vesical catarrh. Its fragrant odor renders it a very agreeable antiseptic application for rated conditions of the mouth and fauces, but makes it very attractive to flies, which fact together with its high price will prevent it becoming a favorite in hospital practice. A solution, used as a mouth-wash, is very efficient in removing the odor of tobacco from the breath. Thymol is almost specific against the intestinal parasite *ankylostomum duodenale*, for which it is given in three or four doses of 10 to 30 grains, well triturated, in capsules; care being taken that no alcoholic drink is ingested afterwards, in order to avoid its absorption and the consequent poisoning thereby.

TIGLII OLEUM, Croton Oil,—is a fixed oil expressed from the seed of *Croton Tiglium*, a small tree of the nat. ord. Euphorbiaceæ, a native of India. The oil is of a pale or brownish-yellow color, somewhat viscid and slightly fluorescent, of fatty odor, acrid taste and slightly acid reaction; soluble in 60 of alcohol, freely in ether, chloroform, or carbon disulphide. Its composition is very complex and has not been thoroughly made out, but it is known to contain the glycerides of several fatty acids, also a peculiar acid named *Tiglinic Acid*, $C_5H_8O_2$, which is isomeric with Angelic Acid. Dose, ♏ ⅓–ij, in pill, emulsion or tincture.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Externally Croton Oil is highly irritant, producing a pustular eruption which heals by scabbing and may leave unsightly cicatrices. Internally it is a powerful drastic cathartic, producing in one or two hours copious watery stools, in overdoses causing great congestion of the intestinal canal and perhaps death from gastro-enteritis. Vomiting usually occurs after large doses, so that the irritant hyper-catharsis is not always observed. It is absorbed into the blood, and produces glandular hyperemia as well as direct inflammation of the intestinal mucous membrane, together with increased peristaltic action. Its cathartic power is increased by the addition of an alkali, and is manifested, though in less degree, when applied to the integument.

Croton Oil is used as a hydragogue cathartic when a speedy and complete evacuation of the bowels, diminution of arterial pressure and prompt derivative action are desired, as in apoplexy, impaction of the intestines, dropsy, lead constipation, paralysis, etc. It is contraindicated when either debility, organic obstruction or inflammatory conditions of the stomach and bowels exist. The smallness of the dose makes it a very easily administered and manageable purgative. An inconsiderable fraction of a drop, absorbed by a pellet of sugar or bread, may be given in repeated doses until the desired effect is obtained. It has been used as a vermifuge against tapeworm. Externally it is employed as a counter-irritant in ovaritis, bronchitis, pleurisy, rheumatism, neuralgia, glandular swellings and in laryngeal and pulmonary diseases. The Linimentum Crotonis of the Br. Phar. contains 1 part of the oil in 3½ each of alcohol and of [illegible] of cajuput, and is a useful pustulant preparation, being more manageable then the oil itself.

TONGA (Unofficial),—is a mixed drug said to be obtained from the Fiji Islands, consisting of thin barks, root-fibres and leaves, tied into long bundles. The fibrous material is believed to be derived from *Rhaphidophora vitiensis*, a creeping plant of the nat. ord. Araceæ, containing starch, potassium chloride, and a volatile alkaloid *Tongine*. The barky portion is referred to *Premna tatiensis*, a shrub or tree of the nat. order Verbenaceæ, and contains a little volatile oil, sugar, pectin, etc. A fluid extract is on the market, which may be given in doses of ♏xxx–ʒj thrice daily.

Tonga was introduced by Ringer and Murrell as a remedy for neuralgia in 1880, stating that they had used it with gratifying results. Since then reports have differed considerably in regard to its efficacy, and from the fact that Dr. Ringer does not mention it in the later editions of his Handbook of Therapeutics, it may be inferred that his further experience with it has not borne out the claims first made.

TOXINS (Unofficial).—The toxins are specific poisons produced by bacterial metabolism in suitable media, and when circulating in the animal organism are the immediate causes of the acute infectious diseases. Many of their active principles are of albuminous nature, the so-called *Toxalbumins*. Toxins have been obtained from ripe cultures of the bacteria of tetanus, diphtheria, tuberculosis, cholera, typhoid fever, anthrax, pneumonia, glanders and swine-plague, also from cultures of streptococcus erysipelatis, bacillus prodigiosus, etc. The treatment of diseases due to pathogenic microbes by the toxic products of their own particular bacteria is based upon the theory that these germs produce substances in their culture media which are inimical to their own life. The treatment of tuberculosis by Koch's tuberculin and the inoculations of Haffkine against cholera are examples of true toxin treatment. The vaccinations of Jenner for variola and Pasteur for rabies are of the same nature when employed as remedial methods, the material being obtained from a morbid product of the disease in the one case and from the diseased tissue itself in the other, the culture medium in both being the blood and tissues of the infected animal organism.

It has been frequently observed that patients afflicted with malignant disease have been greatly benefited by an intercurrent attack of erysipelas, in consequence of which the tumors seemed to undergo retrogressive changes. This has suggested the employment of the toxins of streptococcus erysipelatis and bacillus prodigiosus in inoperable cancer, and may lead to the treatment of other diseases by the toxins of bacteria hitherto unassociated with them.

The injection of a toxin, in gradually increasing doses at proper intervals, will confer immunity in many cases upon the animal so treated against [illegible] responding disease and its particular bacteria. This is im- [illegible] rred to another animal by injecting into its cellular [illegible] the immunized one, and this serum will also act remedially on a subject of the disease if administered early in its course (Behring). The immunizing and curative action of the serum is believed to be due to the existence of an antitoxin in the blood of the inoculated animal, elaborated by the living cells of its tissues as a defence against the action of the toxin. These facts and hypothesis form the basis of the treatment of certain diseases by antitoxic serum (described under the title ANTITOXINS, *ante*, page 174 *et seq.*), which now promises better results than any other system of bacterio-therapy.

The toxin produced by any particular bacteria varies greatly in power through very slight circumstances. It may be weakened or increased in virulence be the cultivation of its bacteria on different culture media or on the same media with different surroundings as to oxygen, temperature, etc.; also by passing successive generations of these organisms through a definite series of animals, chosen for their natural insusceptibility or susceptibility thereto. The pathogenic microbes of several diseases are now cultivated in test-tubes, forced to acquire an increased or lessened degree of virulence or toxin-producing power as required, are separated from the poisonous products of their metabolic life-work, and by the inoculation of either their progeny or their chemical products (toxins) the corresponding diseases are reproduced upon healthy animals in almost any desired degree of intensity.

Repeated efforts have been made in some cases to separate from these bacterial products a germicidal ingredient without its toxic associates, which might prove curative for the corresponding disease. The *Tuberculocidin* and *Antiphthisin* of Klebs are claimed to be such substances, and are described in the following pages.

Tuberculin, or *Koch's Lymph,* announced as a secret and specific remedy for tuberculosis by Professor R. Koch, of Berlin, ten years ago, was subsequently stated by him to be an extract of the products of pure cultures of the tubercle bacillus, made with glycerin and water. In Koch's preliminary statement to the Berlin meeting of the International Medical Congress in 1890, the chief point made was that guinea-pigs could be rendered immune to inoculated tuberculosis by means of this agent, but even this has been denied by other observers. In his extended paper published in November, 1890, he stated that the remedy would not directly kill the bacilli, but that it acted powerfully and specifically upon the living tuberculous tissue, caused a necrotic condition thereof and hastened its disintegration; also that it might be expected to increase the resistant power of healthy tissue and thereby starve the bacilli, check their increase, and lead in many cases to the cure of the disease. The actual result, however, as Virchow and others soon pointed out, was to soften and disintegrate quiescent deposits and to disseminate the bacilli throughout the body, forming new foci of active infection in other situations. The severe reactions, which followed the injections of the lymph in many instances, proved that serious risk must attend its general use; and that, like most remedies for phthisis, it could do good only in a few carefully selected cases. A sense of profound disappointment followed the enthusiasm at first excited, with the result that the remedial action of tuberculin became thoroughly discredited and its use was almost universally abandoned. It has lately become of interest again by reason of the persistent efforts to extract from it a germicidal constituent free from toxins (see *infra*), as also by the results obtained in tuberculosis with the blood serum of animals immunized by its repeated inoculation. (See the article on TUBERCULOSIS ANTITOXIN, *ante*, page 180.)

The violent action of tuberculin, together with its source, prove it to be a true bacterial toxin. Taken by the mouth it is inert, being probably digested in the stomach. In small dose (one milligramme of the original lymph) injected hypodermically upon healthy subjects, it gives rise to slight pains in the limbs and a transient sense of fatigue; but the same quantity injected upon tuberculous subjects produces a very powerful reaction both locally and generally, the constitutional effects being similar to those accompanying an acute exacerbation of the disease. About three hours after the injection a decided rigor occurs, which is followed by a rapid rise of temperature and pulse-rate; also pains in the limbs, a sense of great fatigue, drowsiness, nausea and loss of appetite, these effects lasting from 12 to 15 hours. In cases of advanced phthisis with cavities, after the injection of tuberculin the temperature has risen to 105.8° F., which falling suddenly collapse has occurred and the patients have died. If the case presents a local tuberculous lesion, this swells and becomes tender to the touch and the skin over it is inflamed. In pulmonary cases the reaction is greater than from the same dose in those having surgical tuberculous lesions; the cough increases, there is great distress and dyspnea, the patient feels decidedly worse and occasionally suffers a slight collapse. When the reaction has subsided the patient feels comparatively well and generally better than before. In cases of lupus the effects of the injection are very marked. Within three hours there arises a feeling of tightness with heat and burning over the face and nose, and an eczematous exudation sets in, which continues about 48 hours and dries into crusts on the surface of the lesion. After two days these symptoms begin to subside, and after nine days the crusts have fallen off and the affected tissue appears shrunken, red and shiny, like the surface of a lupus patch which has been scraped with a Volkmann's spoon.

The principal lessons taught by the history of Koch's tuberculin are pathological rather than therapeutical, and cannot be set forth here. An important one is that any treatment in tuberculosis which promotes destructive changes instead of conservative ones, shown in this case by the breaking down of the lung tissue and its appearance on a large scale in the sputum, cannot be other than detrimental to the patient, as the area of infection, instead of being limited as it was, is thereby considerably widened. As a diagnostic agent it is certainly of value in showing the presence or absence of latent tuberculosis, but for this purpose it should only be used in veterinary practice, for the ordinary means of diagnosis are already so reliable that so dangerous a procedure is not justifiable on human subjects.

Professor Koch has acknowledged that tuberculin is only serviceable in the initial stage of phthisis and in cases of simple infection, also that when the case is complicated by the presence of other microbes it is of no service and often does harm. Professor Ewald has stated that so far as clinical and experimental testimony had gone it possesses no specific curative action, and that its use must finally be abandoned on account of the dangers attending its administration. The physicians of the Hospital for Consumption and Diseases of the Chest at Brompton, England, reported on its systematic employment in 30 cases of pulmonary tuberculosis and lupus, with the following conclusions: "That the tuberculin did not favorably influence the course of the disease in the majority of cases; that in some the effects were detrimental; and that even in the stationary and improved cases it was difficult to ascribe any distinct improvement to the injections which might not have been equally attained under the treatment ordinarily employed in the hospital."

Koch's Tuberculin was distributed in the form of a brown solution, which by evaporation and filtration had been concentrated to one-tenth the volume of the ripe culture fluid. One part of this original lymph, added to nine parts of distilled water containing ½ to 1 per cent. of carbolic acid, made the so-called "mother solution," in which form, though too powerful for use, it will keep a long time, being still further diluted as required. One part of this 10 per cent. solution added to nine parts of distilled water makes the dilute per cent. solution used for injection. If, as Koch estimated, the original lymph contains but one per cent. of the dry, active substance, its proportion in the injection solution would be only one in ten thousand. The dose of the latter solution ranged from 0.1 cc. to 1.0 cc., corresponding to 0.001 cc. and 0.01 cc. of the original lymph; and was administered by a sterilized hypodermic syringe of special form, under strict aseptic precautions, beneath the skin of the back between the scapulæ. In early lung cases a period of about four to six weeks completes the course of treatment. Koch's syringe contains 1.0 cc. and is graduated in tenths, each division representing one minimum dose (0.1 cc.) of the per cent. solution. When large doses are reached the stronger 10 per cent. solution may be used in appropriate quantity. For cases of lupus much heavier doses were employed at first, even ten times the quantities mentioned above, but necessarily at much longer intervals. These large doses, however, give rise to most formidable and dangerous symptoms, and caused fatal results in some cases. Dr. Whitla believes that better results would have been obtained by the use of much smaller doses.

Tuberculin-R. Professor Koch has produced three new tuberculins, named Tuberculin-A, Tuberculin-O and Tuberculin-R. The last-named is the only one of therapeutic value, and is prepared by extraction of pure cultures of tubercle bacillus with 40 50 per cent. glycerin and repeated precipitation by alcohol. The result is a snow-white mass which turns a light gray color upon drying. It is soluble in water, but the aqueous solution is unstable; a solution in 50 per cent. glycerin remains unchanged. It is administered subcutaneously in the muscles of the back between the shoulder-blades.

After injection the point is covered with iodoform collodion and bandaged with iodoform gauze. This preparation proved decidedly active in immunizing against the tubercle bacilli. Decided benefit was obtained from it in every case of lupus treated, also in the early stage of pulmonary tuberculosis. Maragliano states that there is no real difference between the new tuberculin and the old one, and that the latter is the best of the two. Experience with it in Erb's and von Leyden's clinics did not show any striking results. Kernig warns against its use, and Bouchard terms it "an impure, bacteria-infected product, entirely unsuited to scientific investigations." Dose, gr. $\frac{1}{250}$–$\frac{1}{65}$; $\frac{1}{4}$ to 1 mg.

Tuberculocidin. After Koch's tuberculin became discredited, its composition became the subject of analytical research with the view of separating out its toxic constituents and obtaining a remedial agent from it. These investigations were made principally by W. Hunter, Watson Cheyne and E. Klebs of Zurich. The latter treated the crude tuberculin with platinum chloride, which precipitates the alkaloidal constituents or toxins, leaving a solution which he named *Tuberculocidin*, on account of its supposed antagonism to the tubercle bacillus. With this solution he treated 75 cases of phthisis, and reported 14 as cured, 45 improved, 14 unimproved, and 2 died. During experiments on animals with it he claims to have observed the complete regression of an apparently advanced tuberculosis. Langermann used it in four cases of pulmonary tuberculosis with varied results. He admits that it does not cause either serious constitutional effects as tuberculin does or irritation at the site of injection, but as to its curative action he has great doubt. Klebs has apparently abandoned this agent in favor of Antiphthisin, his more recent but similar product.

Antiphthisin is the latest result of Klebs' long-continued efforts to extract a non-toxic and curative substance from tuberculin, which, according to his most recent analysis, contains (1) *tox-albumins*, precipitated by sodic iodide of bismuth, (2) *alkaloids*, (3) an *albuminoid* derived from the bodies of the dead bacilli, (4) a *soz-albumin*, precipitated by absolute alcohol after the removal of the toxic ingredients. It is claimed by Klebs that an aqueous solution of this soz-albumin, prepared by him and named *Antiphthisin*, possesses the germicidal and curative properties of tuberculin without any of its toxic effects. With this product he claims to have caused the complete cure of tuberculosis in guinea-pigs, and to have obtained 90 per cent. of good results (whatever that may mean) for all stages of phthisis in the human subject. He states however that it will produce its fullest benefits in the very early stages of the disease, for which stages alone it is recommended as a specific remedy; and that in advanced and complicated cases the prospects for its successful use are less certain. In asking physicians to give it a trial he requests that they will not try the remedy except in cases of pure tuberculosis, excluding for the present cases of mixed infection, septic cases, and all such as have [illegible] degeneration or are so far reduced that they must die of the [illegible] or exhaustion present. These requirements may be good

reputation of the remedy, but are most difficult to observe in
as they confine it to a class of cases which seldom come to the
in that stage and which are not easily diagnosed with accuracy
en. Von Ruck, who is associated with Klebs, reports as his
ce of nearly 100 cases of phthisis treated with this remedy, that
unmistakable influence over the fever, that under its use percus-
less becomes perceptibly less, bronchial and harsh breathing give
puerile and then vesicular respiration, the lung-capacity increases,
h diminishes, the sputum loses its purulent character and lessens
ity, while the bacilli therein diminish in number and show
signs of degeneration. Denison, of Denver, reports that most
ses treated by him with antiphthisin gave evidence of its germi-
l healing effects, "in the lessening of the number of germs to
found, and their degenerative or incomplete forms thrown off
od sized doses were reached, as well as in the clearing up of con-
l or infiltrated tubercular lung tissue."

hisin is prepared by Professor Klebs, who explains the process of manufacture
: "We take the ripe culture of the tubercle bacillus and reduce it to one-tenth
ginal amount by evaporation in a vacuum and filter. This really is the tuber-
repared by Professor Koch. To the filtrate we now apply an acid solution
odide of bismuth and obtain a precipitate which is filtered out. This precipi-
ents the toxic properties of tuberculin, as proved both in the animal experiment
application to the human being for diagnostic purposes. . . . After the
ins are filtered out, we precipitate further by the addition of absolute alcohol
substance resembling in its chemic reaction a peptone, and this organic sub-
issolved in distilled water is antiphthisin. In the animal experiment we find
lcoholic precipitate does not produce fever or toxic symptoms of any kind.
in cannot be given by the mouth, being an albuminoid substance it would be
the stomach. The remedy has no diagnostic properties, there is no reaction
I think my remarks will make it plain, that the diagnostic value lies in the
d the curative substance separated from the toxins is antiphthisin." (From
narks in German, before the Section on Diseases of Children at the Baltimore
the American Medical Association, May, 1895, translated by Von Ruck.)
ily dose for an adult is 0.1 cc. at first, increased daily or every other day until
reached. This dose may be repeated daily for a week, and is then gradually
to 1.0 cc., which latter dose is again continued for a time, before being again
It is seldom necessary to go beyond 2.0 cc., though a dose of 10 cc. has been
he administration may be intermitted for a time after 50.0 cc. have been used.
certain dose, the improvement is rapid and satisfactory, there is no reason
the quantity given; and physical examination should constantly accompany
l the future course. The remedy may be administered hypodermically under
ecautions, or by rectal injection. It is put up in vials containing 15, 30, and
d is sold at the rate of fifty cents per cubic centimeter.

ipelas and Prodigiosus Toxins. Malignant tumors have
ally been observed to disappear after the patient had suffered from
urrent attack of erysipelas. When the discovery was made that
erysipelas could be produced by the inoculation of pure cultures
reptococcus erysipelatis, this inoculation was practised upon sub-
cancer as a remedial measure. The results, though favorable,
so complete as in the cases acted upon by accidental erysipelas,

and the inoculated disease often proved fatal to the patient. Coley then employed the toxin of the streptococcus instead of the culture itself, and reported a number of apparent cures of malignant disease thereby. Later it was found by Roger that the bacillus prodigiosus has the power of intensifying the virulence of the streptococcus erysipelatis, and by using a mixture of the toxins of both these germs, Coley obtained a more beneficial effect than from the erysipelas toxin alone. The remedial action is much more efficient in sarcoma than in carcinoma, though some cases of the latter disease are reported as apparently cured by this treatment. Including all the cases of sarcoma in which these mixed toxins have been employed by Coley, there are 43 such reported of which 11 were apparently cured. Professor Senn of Chicago has found negative results in his own experience of this treatment, and states that in all his cases these injections failed to effect even temporary improvement. Coley prepares these toxins in the usual manner, and avoids the danger of inoculating erysipelas itself by subjecting the cultures to a temperature (136.4° F.) sufficient to destroy the germs. The commencing dose is 1 or 2 minims, injected once daily into the tumor or subcutaneously in its vicinity and gradually increased. This method should be employed only in cases which are manifestly unfit for operative interference.

Richet and Héricourt injected a serum obtained from animals inoculated with the filtered emulsion of an osteo-sarcoma into a recurrent sarcoma of the chest-wall and also into a supposed carcinoma of the stomach. The tumors were thereby reduced in size and general improvement followed, but in neither case was there any microscopical examination made, hence the diagnoses are uncertain.

Emmerich and Scholl claim that excellent results were obtained by them in the treatment of both sarcoma and carcinoma by injecting into the growth an antitoxic serum obtained from sheep inoculated with the toxins of virulent erysipelas streptococci. Other experimenters, including Bruns and Angerer, do not confirm their statements in this respect; and as their observations were limited to a few weeks, it is impossible to regard their cases as presenting evidence of cure.

Cholera Toxin. An extended series of inoculations against cholera was carried out in India by Dr. Haffkine, whose procedure comprises the preparatory use of a weak virus followed by a second inoculation with a stronger one. He obtained the weak virus by passing air and oxygen over a culture of the comma bacillus on agar at a high temperature, which so modified the microbes that when injected they produced only slight local puffiness, followed by a mild reaction. The second inoculation was made five days after the first, and with a virus of such intensity that it killed a guinea-pig in eight hours. The virus, used on the human subject subsequent to the preparatory inoculation, caused only slight local and constitutional disturbance, thereby proving that the first inoculation had conferred a certain degree of immunity against its effects. The symptoms subside in another five days, and not until then can it be hat the operation of preventive inoculation against cholera is com-

Dr. Haffkine made 42,445 such inoculations, without a single ce of mishap or injury to health resulting therefrom. The results ed were highly favorable, the statistics demonstrating for this pro- e a remarkably protective power against cholera in a country where lisease is endemic. The figures are furnished, not by Dr. Haffkine, y responsible British medical officers assigned to the duty of veri- the result in each case.

bies Toxin. Although no microbe has yet been found associated abies, there is abundant evidence to prove that the specific virus of isease is a micro-organism, inasmuch as it behaves exactly like one. ır found that the virus is most abundant in the spinal cord of the animal and showed that its inoculation upon a healthy animal will ce the characteristic symptoms of the disease, also that the virus e attenuated in virulence by drying the spinal cord containing it. so found that by inoculating on each successive day the virus from l dried during a shorter period than that used on the previous day, nimal so treated may be gradually made almost certainly secure st rabies, either from the bite of a rabid animal or from any method cutaneous inoculation. Upon these facts he founded his preven- eatment of this disease commenced by him in Paris in 1885, which ts in the daily inoculation of the bitten person with emulsions of ally increasing virulence, made from the dried spinal cords of rab- ıat have died from inoculated rabies. By this procedure chemical nces (toxins), produced during the life of some specific organism nown to be inhibitory of its growth, are introduced into the system patient (V. Horsley).

ring the eight years from 1886 to 1893 inclusive there were treated s method at the Pasteur Institute in Paris 14,430 bitten persons many countries with 72 deaths resulting, a mortality rate of ½ of cent. for the entire number; the mortality for each year having ly decreased from 0.94 per cent. in 1886 to 0.25 per cent. in 1891, per cent. in 1892, and 0.24 per cent. in 1893. During the four from 1892 to 1895 inclusive, there were treated at the Pasteur ute in New York 424 bitten persons from all parts of the United s and Canada, among whom only 2 deaths occurred.

e patient bitten by an animal supposed to be rabid should be sent ce for treatment to one of the Pasteur Institutes, and should be npanied if possible by a piece of the medulla oblongata of the animal, in order to determine by experimental methods whether nimal was rabid or not. The specimen should be removed with an tic knife and placed in a mixture of equal parts of pure glycerin water, previously sterilized by boiling. The period of treatment is lly 15 days, during which from 2 to 6 inoculations are administered daily with viruses of gradually increasing intensity; the number depending on the time which has elapsed between the infliction of the bite and the commencement of the treatment.

The *Hydrophobia Committee*, appointed by the British Parliament in 1887 to investigate Pasteur's treatment of rabies, consisted of Sir James Paget, chairman, Sir Joseph Lister, Dr. Lauder Brunton, Sir Richard Quain, Dr. Geo. Fleming, Sir Henry Roscoe and Dr. Burdon Sanderson, with Professor Victor Horsley as secretary. Their report to parliament, made after an extended investigation in Paris and much experimental research, states as follows: "It may hence be deemed certain that M. Pasteur has discovered a method of protection from rabies comparable with that which vaccination affords against infection from small-pox. It would be difficult to overestimate the importance of the discovery, whether for its practical utility or for its application in general pathology. . . . From the evidence of all these facts we think it certain that the inoculations practiced by M. Pasteur on persons bitten by rabid animals have prevented the occurrence of hydrophobia in the large proportion of those who, if they had not been so inoculated, would have died of that disease." Professor Victor Horsley, the secretary of the committee, said three years afterwards in *Fowler's Dictionary of Medicine*, that "its adoption has reduced the mortality among those bitten by indubitably rabid dogs from 15 per cent. to 1.3 per cent."

Tizzoni and Cantani have published reports of experiments on the cure of rabies after its actual outbreak. They found that an alcoholic precipitate from the serum of highly immunized animals not only caused protection against rabies but also cured it, even after the first symptoms of the disease had made their appearance. It has also been announced that at Bologna a cure of rabies in the advanced stage was effected by a special mode of the Pasteur treatment. A man bitten by a rabid dog, who had subjected himself to the inoculations, was seized with the phenomena of paralytic rabies. Paralysis having progressed from the lumbar region over the whole organism, bladder and rectum included, intravenous injections of the fixed virus were administered, whereupon the painful symptoms diminished and finally a perfect cure was accomplished.

Mallein is an extract in glycerin of the products of cultures of the bacillus mallei, the microbe associated with glanders. This toxin, when injected into animals affected with glanders, produces a strongly marked febrile reaction, similar to that caused by tuberculin in tuberculous subjects. It is extensively employed in veterinary practice for the purpose of testing horses suspected of being infected with the disease. However, a case occurred in London in which ten horses in one stable showed the typical reaction after the use of mallein, but subsequently developed none of the symptoms of glanders.

TRAGACANTHA, Tragacanth,—is a gummy exudation from *Astragalus gummifer* and from other species of *Astragalus*, shrubs of the nat. ord. Leguminosæ, growing chiefly in Asia Minor and Persia. It occurs in shell-like, curved or contorted bands, swelling with water to a gelatinous mass, which is tinged blue by test-solution of iodine, and consists of a mixture of *Arabin*, or gum-arabic, which is soluble in water, and *Bassorin*, a gum which is insoluble in water but swells up in it, also a little starch.

Mucilago Tragacanthæ, *Mucilage of Tragacanth*,—Tragacanth 6, Glycerin 15, Water to 100. Dose, ℥j or more.

Tragacanth is demulcent, but in large quantities may cause indigestion. It is chiefly employed to suspend resins and heavy powders in emulsion. The mucilage may be [illegible] as a vehicle for active agents in gargles for pharyngitis, and to cause cohesion in the preparation of pills, troches, etc. It is a constituent of 12 of the 15 official troches, and [illegible] better agent than acacia for making emulsions of cod-liver oil.

TRITICUM, Couch-grass,—is the rhizome, gathered in the spring and deprived of its roots, of *Agropyrum repens*, the Couch-grass, a perennial plant of the nat. ord. Gramineæ, abounding in meadows and cultivated grounds, where it ranks as a weed though of the same genus as wheat. It contains much sugar and a gum-like principle, *Triticin*. Dose, ʒj–℥j, in infusion or decoction.

Extractum Tritici Fluidum, *Fluid Extract of Triticum*.—Dose, ʒj–℥j, well diluted.

Couch-grass is demulcent, emollient and a feeble diuretic. It is chiefly used in cystitis and irritable bladder. The infusion is a popular fever-drink in Europe, and has had of old a considerable reputation in dysuria.

ULMUS, Elm, *Slippery Elm*,—is the inner bark of *Ulmus fulva*, an indigenous tree of the nat. ord. Urticaceæ. It contains a large quantity of mucilage which it readily parts with to water.

Mucilago Ulmi, *Mucilage of Elm*,—Elm 6, Water to 100, digested for an hour and strained. Dose, ad libitum. Should be freshly made when wanted.

Slippery-elm Bark is demulcent, slightly astringent and somewhat tonic. It is used internally in diarrhea, dysentery and affections of the urinary passages, and externally in the form of poultice as an emollient application in cases of inflammation. It is also employed in the dilatation of fistulæ, strictures and the os uteri.

UVA URSI, Bearberry,—the leaves of *Arctostaphylos Uva-ursi*, a low, evergreen shrub of the nat. ord. Ericaceæ, inhabiting the northern latitudes and high mountains of Europe, Asia and America. They contain tannic and gallic acids and 3 principles, viz., *Arbutin*, a bitter glucoside, neutral, crystalline, soluble in warm water and resolvable into glucose and *Hydroquinone*; *Ericolin*, bitter and amorphous; *Ursone*, resinous, neutral, crystalline and tasteless. The Californian Manzanita (*Arctostaphylos glauca*) is an allied plant and also contains arbutin and tannin. Dose of the powdered leaves, gr. x–ʒj in infusion or decoction.

Preparations.

Extractum Uvæ Ursi, *Extract of Uva Ursi*.—Dose, gr. ij–x.
Extractum Uvæ Ursi Fluidum, *Fluid Extract of Uva Ursi*.—Dose, ♏x–ʒj.
Infusum Uvæ Ursi, *Infusion of Uva Ursi* (Unofficial),—℥j to Oj. Dose, ℥j–ij.
Arbutinum, *Arbutin*, $C_{24}H_{32}O_{14}$ (Unofficial).—Dose, gr. iij–v.

Uva Ursi is astringent, tonic and feebly diuretic. Used in large quantity it produces vomiting and purging and is alleged to have oxytocic power. Arbutin is an efficient diuretic, and is decomposed in the body yielding hydroquinone, excreted by the kidneys as hydroquinone-sulphuric acid, which is non-toxic and imparts a brown color with antiseptic and slightly irritant qualities to the urine.

Bearberry was formerly used in all calculous affections and chronic disorders of the urinary passages. It has some reputation as an antilithic, and is useful in gravel, chronic nephritis, cystitis and urethritis. It relieves incontinence of urine, dysuria and strangury, and has proved serviceable even in uterine hemorrhages. Arbutin has been successfully employed in cardiac dropsy as a diuretic, also in urethritis.

VALERIANA, Valerian,—is the rhizome and roots of *Valeriana officinalis,* a large, herbaceous plant of the nat. ord. Valerianeæ, having small, white, or rose-colored flowers. The plant is a native of Europe, but is cultivated in Vermont and New York. It contains a *Volatile Oil,* from which are developed by oxidation *Valerene,* $C_{10}H_{16}$ a terpene, *Valerol* or Baldrian Camphor, $C_{12}H_{20}O$, and *Valerianic Acid,* $C_5H_{10}O_2$, which occurs also in many other plants and in cod-liver oil. The Valerianic Acid of pharmacy is obtained as a product of the oxidation of amylic alcohol, and from it are formed the various valerianates. It is not identical with the natural acid. Dose of the powdered root, gr. x–xxx.

Preparations of Valerian.

Extractum Valerianæ Fluidum, *Fluid Extract of Valerian.*—Dose, ♏x–ʒj.

Tinctura Valerianæ, *Tincture of Valerian,*—strength 20 per cent. Dose, ʒss–ij.

Tinctura Valerianæ Ammoniata, *Ammoniated Tincture of Valerian,*—has of Valerian 20, Aromatic Spirit of Ammonia to 100. Dose, ʒss–ij.

Oleum Valerianæ, *Oil of Valerian* (Unofficial),—the volatile oil, sp. gr. about 0.950, a greenish or yellowish, thin liquid, having the odor of Valerian, an aromatic taste and a slightly acid reaction, readily soluble in alcohol. Dose, ♏ij–v.

The Oil is by far the best preparation for use, as the tinctures are extremely nauseous and the fluid extract is too bulky. The taste is best covered by Cinnamon.

Preparations of Valerianic Acid.

Valerianates of Ammonium, Ferrum, Quinine and Zinc are official and are described under the titles of their respective bases. They are made with the artificial valerianic acid and do not represent the action of the plant but rather that of the bases from which they are prepared.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Valerian is antispasmodic and a gentle stimulant to the nervous and circulatory systems. It is sedative to reflex excitability, antagonizing the action of strychnine, brucine, thebaine, etc., and is laxative, diaphoretic and anthelmintic. Its taste and odor are very disagreeable but cats are extravagantly fond of it. In these animals it greatly excites the sexual appetite, probably from a resemblance between its odor and theirs when under venereal excitement. After a time it produces in them violent spasms and convulsions. In full doses it increases the action of the heart and raises the temperature, in most persons producing exhilaration (in some, slight mental disturbance), with formication of the hands and feet. Long used it induces a condition of melancholia. Large doses cause hiccough, diarrhea, nausea and vomiting, frequent micturition with tenesmus of the bladder and lithates in the urine, mental disturbance even to delirium, reduced motility and sensibility and lessened reflex excitability. The Oil in large doses is paralyzant to the brain and the spinal cord, lowers the blood-pressure and slows the pulse.

The Valerianates follow their bases in general action but are supposed to possess some of the sedative qualities of their acid constituent.

ian was formerly employed in epilepsy but was probably useful
the hysterical form of that disease (hystero-epilepsy). It is a
remedy in all forms of hysteria, especially in young and delicate
It is useful in the flatulence of infants and in that of hypo-
iacal and hysterical subjects, also for coughs of nervous type,
ng-cough, diabetes insipidus, convulsions due to worms and in
with vital depression. In the coma of typhus fever the oil
remarkably efficient in a series of 135 cases out of 172 cases
by it. Ammonium Valerianate is used in the same class of dis-
is is Valerian. It is often a good remedy for nervous headache,
stered in 10-grain doses in an elixir. Zinc Valerianate has been
d to combine the antispasmodic power of valerian with the nerve-
ffect of a zinc salt. It has been used in cholera, epilepsy and
ia, frequently with considerable success. The Ferric and Quinine
nates are used as are the other salts of their respective bases.

ILLA,—is the fruit of *Vanilla planifolia*, a perennial climbing plant of the
Orchideæ, native of the West Indies and tropical America, but cultivated in
. Its characteristic odorous principle is *Vanillin*, the methyl-ether of protocate-
lehyd, which oxidizes slowly in damp air to *Vanillic Acid*, and may be resolved
yl chloride and protocatechuic acid. Vanillin may be made synthetically from
or from Eugenol. Dose, indefinite.

ura Vanillæ, *Tincture of Vanilla*,—10 per cent. Dose, a few drops, accord-
e strength of flavor desired.

nisci Ferri, *Troches of Iron*,—contain about $\frac{1}{10}$ per cent. of Vanilla.

a is an aromatic stimulant, with considerable influence on the nervous system.
efly employed as a perfume and for flavoring purposes but has been used with
hysteria and low fevers.

RATRUM VIRIDE, American Hellebore,—is the rhizome
ots of *Veratrum viride*, the Indian Poke (Poke-root, Swamp Helle-
an indigenous plant of the nat. ord. Liliaceæ. It contains the
ls *Veratrine* (Cevadine) $C_{32}H_{49}NO_9$, *Jervine*, *Pseudojervine* and
vine, also resin, gallic acid, sugar, etc.

Allied Plants.

atrum Album, *White Hellebore*,—is a native of the mountainous
of continental Europe, and so closely resembles V. Viride in
nce and characteristics that it may be considered a variety of the
ant. The rhizome was official in the U. S. P. 1870. It contains
aloids *Protoveratrine* $C_{32}H_{51}NO_{11}$, *Jervine*, *Pseudojervine*, *Rubi-*
, *Protoveratridine* and others.

atrum Sabadilla, *Cevadilla* (*Asagræa officinalis*),—is a bulbous
of the nat. ord. Liliaceæ, indigenous to Mexico and Central
a. It contains the alkaloids *Veratrine* (Cevadine), *Cevadilline*,
ne, *Sabadinine* and another base known as *Wright's Veratrine*.

This plant is the source of the official mixture of alkaloids called Ve[illegible]trine (see below).

Veratrine can be decomposed into Angelic Acid and *Cevine*, a base allied to aconi[illegible]e; Protoveratrine is probably a combination of Isobutyric Acid and a similar base. V[illegible]atrine and Protoveratrine are powerful alkaloids, the latter almost rivalling aconitin[illegible] in toxicity. Jervine, Sabadine and Sabadinine possess some action on the organism. C[illegible]evadilline has not been examined; the others are said to be inert.

The nomenclature of the various veratriæ alkaloids is confusing, having under[illegible]one considerable modification. That given above is the most recent, but many authors fol[illegible]ow Bullock, who gave the names *Jervine* and *Veratroidine* to the chief constituents of v[illegible]ratrum viride and *Veratralbine* to the principal alkaloid of veratrum album. The [illegible]ubstance officially termed *Veratrine* is not the alkaloid so named but is a mixture [illegible] of alkaloids.

Preparations.

Extractum Veratri Viridis Fluidum, *Fl. Ext. of Veratrum Viride.*—Dose, ♏j[illegible]v.

Tinctura Veratri Viridis, *Tinct. of Veratrum Viride*,—40 per cent. Dose, ♏j[illegible]x.

Norwood's Tincture of Veratrum Viride (Unofficial),—has a very high reputa[illegible]on for efficiency,—Dose, ♏v, increased by ♏j every 3 hours, until pulse is down to [illegible]5, when the original dose will hold it there. Larger doses in puerperal convulsions.

Veratrina, *Veratrine*,—is a mixture of alkaloids prepared from the seeds of *Aso*[illegible] *officinalis* (see p. 521). A white, or grayish-white, amorphous powder, highly irri[illegible]nt to the nostrils, of very acrid taste, producing tingling and numbness of the tongue [illegible]nd constriction of the fauces; slightly soluble in cold water, soluble in 3 of alcohol, [illegible]6 of ether, in 2 of chloroform, in 96 of glycerin and in 56 of olive oil. Dose, gr. $\frac{1}{30}$–[illegible]

Unguentum Veratrinæ, *Veratrine Ointment*,—Veratrine 4, Olive Oil 6, Benzoin[illegible]ed Lard 90. For local use.

Oleatum Veratrinæ, *Oleate of Veratrine*,—Veratrine 2, Oleic Acid 98. Local [illegible]e.

PHYSIOLOGICAL ACTION.

Veratrum Viride is closely allied to Aconite in action, being a power[illegible]ful cardiac depressant and spinal paralyzant. It differs from Aconite in affe[illegible]ting the respiration to a much less degree, in being a systemic eme[illegible]o-cathartic, in paralyzing the motor system centrally, impairing the refle[illegible]es but leaving sensation unimpaired, and in having little or no diaphore[illegible]ic or diuretic action in ordinary medicinal doses. It causes great muscu[illegible]ar depression but is seldom fatal; when death does result from its use it occurs by paralysis of the respiration. In small doses Veratrum redu[illegible]es the force of the pulse, but does not at first affect its rate. If continu[illegible]d for some time, the pulse becomes very slow, soft and compressible; risi[illegible]ng on the least exertion to be very rapid and feeble. At the same time the[illegible]re is great muscular weakness, and frequently nausea and vomiting. Lar[illegible]ge doses increase these symptoms very much, the pulse becoming very rap[illegible]id and so small as to be almost imperceptible; the skin is cold and clamm[illegible]y and constant vomiting, extreme debility, giddiness, impaired vision, a[illegible]n partial unconsciousness ensue.

Veratrum Album contains the powerful alkaloid Protoveratrine. [illegible] general action is similar to that of its congener, but it is much m[illegible] irritant to the gastro-intestinal mucous membrane, causing viol[illegible] vomiting and purging, intense abdominal and esophageal pain, grea[illegible] reduced temperature and pulse, collapse and death from cardiac and respiratory paralysis.

The official Veratrine is an acrid and intensely irritant powder, consisting of a mixture of alkaloids. It causes violent sneezing, a burning sensation, and free salivation. It affects the heart and circulation similarly to the other Veratriæ and in addition seems to be a direct poison to muscular tissue and to cause violent convulsions before the muscular paralysis sets in.

The action of the alkaloid Veratrine on the central nervous system and sensory nerve terminations resembles that of Aconitine very closely. Locally applied it causes the same prickling, warm sensation, followed after a time by a feeling of numbness and cold in the part. In contact with the mucous membrane of the nose and throat it gives rise to violent sneezing and coughing. Internally administered the characteristic prickling, burning sensation is soon felt in the mouth and throat, followed by a sense of heat in the stomach, salivation, nausea and vomiting. The prickling sensation spreads to the skin all over the body and profuse perspiration often occurs. The pulse becomes slow and irregular, the respiration slow and labored. In veratrine poisoning the bowels are more affected than with aconitine, severe colic and violent catharsis being usually experienced. Fibrillary contractions of the muscles and convulsions are commonly observed, and collapse occurs, followed by coma and finally by failure of the respiration.

Veratrine stimulates the central nervous system and the sensory nerve terminations, but by large doses this stimulation gives way to paralysis. Applied directly in solution to the peripheral nerves it abolishes their irritability. It increases the catabolic changes in striated muscular tissue, producing prolongation of the period of contraction and causing an increase in the height and absolute strength of the contractions. The result is that the muscles remain shortened for a time after contraction and resist the action of their opposing muscles, so that the animal cannot extend a limb immediately after flexing it and its locomotion is greatly impaired.

Protoveratrine is much more poisonous than veratrine and acts on the same general lines as aconitine. It does not paralyze the motor nerve terminations even when applied to them in quantity. It shortens the contraction period of muscular tissue instead of prolonging it as veratrine does, and it increases the muscular force temporarily but induces its early exhaustion. Jervine, Sabadilline and Sabadinine have the same action as veratrine but are much less poisonous.

Antagonists and Incompatibles.

Opium, Alcohol, Belladonna and Ammonia counteract the cardiac depression. *Morphine* and *Atropine* should be administered hypodermically, or Laudanum internally with alcoholic stimulants; the recumbent position should be enforced, and dry heat applied to the body. Caustic alkalies are incompatible, as they decompose the alkaloids.

THERAPEUTICS.

Veratrum Viride is inferior to Aconite in most of the fevers and inflammation, by reason of its lacking power over excretion. It renders good service in the early stages of many parenchymatous and serous inflammations when occurring in sthenic subjects, especially pneumonia. It is highly esteemed in puerperal fever and in simple hypertrophy, irritable heart and other cardiac disorders. It has been used with remarkably good results in acute mania and puerperal convulsions, and it is of service in aneurism to depress the circulation to the lowest point, but in this case the recumbent position must be strictly observed in order to secure safety. It should always be administered in small doses and its effects carefully watched. In puerperal eclampsia large doses have been administered without danger and with decided benefit, as much as 20 drops of Norwood's tincture every hour for 5 consecutive days and nights in one case, the patient making a good recovery. The same preparation may be given hypodermically, in doses of ♏ij–iv.

Veratrum Album is the Hellebore of the ancient physicians, and was employed by them as a derivative in insanity. It is rarely used at present except by the homeopathists, who give it in the cold stage of cholera, in colic, in the vomiting and purging of summer diarrhea, in whooping-cough and in asthma.

Veratrine is chiefly used externally. The ointment or oleate is applied with benefit in many cases of superficial neuralgia, myalgia and headaches, a small quantity being rubbed in over the seat of the pain. It may be absorbed through an abrasion of the cuticle and give rise to dangerous symptoms. Internally it has been employed as a cardiac sedative in fevers and inflammation, also in acute articular rheumatism, dropsies, dysmenorrhea and various nervous affections, but its uncertainty of action and the dangerous depression which it may produce have caused it to lose favor as an internal remedy.

VERBASCUM, Mullein (Unofficial),—the leaves of *Verbascum Thaspus*, the Mullein-weed, a plant of the nat. ord. Scrophulariaceæ, having large woolly leaves and yellow flowers in dense spikes. Its chief constituent is mucilage, but the flowers contain an oil in very small quantity. An infusion of ℥iv of fresh leaves to the pint of milk is the form in which it has generally been given; a pint to be taken thrice daily.

Mullein is emollient and demulcent, perhaps also slightly anodyne. It has long been a popular Irish remedy in pulmonary affections. Under its use the weight steadily increases in phthisis and other wasting disorders, while expectoration is rendered more easy, cough is palliated and the general condition improved. It is recommended in cystitis, irritable bladder, and diarrhea, and is employed as an enema in dysentery and as a poultice for hemorrhoids. The dried leaves may be smoked with benefit in aphonia from laryngeal irritation.

VIBURNUM OPULUS, Cramp Bark,—is the bark of *Viburnum Opulus*, a shrub of the nat. ord. Caprifoliaceæ.

Extractum Viburni Opuli Fluidum, *Fl. Extr. of Viburnum Opulus*. Dose, ʒ ss–ij.

Viburnum Opulus is highly valued by many practitioners as a remedy for uterine and abdominal pains. The so-called *Viburnum Compound of Dr. Hayden* is stated by its manufacturers to consist of "the active principles of the Viburnum Opulus, Dioscorea Villosa, Scutellaria Lateriflora, and a combination of aromatics, prepared by a process peculiar to ourselves." This they call publishing the formula of the preparation.

VIBURNUM PRUNIFOLIUM, Black Haw,—is the bark of *Viburnum prunifolium*, an indigenous shrub of the nat. ord. Caprifoliaceæ. It contains tannic, oxalic, citric and malic acids, sulphates and chlorides; also two resins, one named *Viburnin*, and *Viburnic Acid* which is identical with Valerianic Acid.

Extractum Viburni Prunifolii Fluidum, *Fl. Extr. of Vib. Prun.* Dose, ʒ ss–ij.

Viburnum Prunifolium is considered to possess nervine, antispasmodic, astringent, diuretic and tonic properties, and to be especially useful in preventing abortion, in the nervous diseases of pregnancy, and in spasmodic dysmenorrhea. It may be administered with cannabis indica, morphine, nerve-sedatives or simple aromatics. No exact observations have been made regarding its action, and its therapeutical claims are denied by many who have used it. It often excites nausea and vomiting.

VIOLA TRICOLOR, Pansy (Unofficial),—is the wild-grown, flowering herb of *Viola tricolor*, the Heart's-ease Pansy, a plant of the nat. ord. Violaceæ, native in Europe, but naturalized in the southern U. S. It contains an active alkaloid, *Violine*, allied in many respects to Emetine, and poisonous. Dose, gr. x–ʒj, in decoction.

Viola is mucilaginous, emollient, expectorant and slightly laxative. Its active principle is emeto-cathartic, but exists in very small quantity. A decoction of the fresh herb in milk, with a poultice of the same, was formerly recommended highly in crusta lactea and impetigo. It is used with benefit in some forms of eczema, especially in that of the head and face, and has had some reputation in bronchitis and constitutional syphilis.

Viola Cucullata, the common Violet, is used in Pennsylvania with success as an internal antidote against rattlesnake venom. The leaves are eaten, and a poultice of salt and indigo is applied to the wound.

VISCUM, Mistletoe (Unofficial),—occurs in two species, (1) *Viscum album*, the European Mistletoe, a small, parasitic, evergreen shrub, of the nat. ord. Loranthaceæ, growing chiefly on deciduous-leaved trees, and (2) *Viscum flavescens*, the American species, growing on oaks, elms, etc. They contain mucilage, starch, fixed oil, resin, salts, etc., and *Viscin*, or Bird-lime, which occurs also in Ilex aquifolium, Gentiana lutea and other plants. Dose, gr. x–ʒj in decoction, or ♏v–xxx of a ten per cent. tincture.

The berries of the mistletoes have produced emeto-catharsis, with great thirst, tenesmus, bloody stools, convulsions and even death in young children. The leaves and twigs have been used in epilepsy, hysteria, chorea, asthma and other nervous affections. The American plant is asserted to possess qualities similar to those of Digitalis and to incite uterine contractions. It has been used in cardiac affections, dropsies, uterine hemorrhages and amenorrhea, also as an abortifacient.

XANTHOXYLUM, Prickly Ash,—is the bark of *Xanthoxylum americanum* the northern species, and of *Xanthoxylum Clava-Herculis* the southern species, of an indigenous shrub of the nat. ord. Rutaceæ. It contains a volatile oil, a fixed oil, resin, gum, coloring matter and the alkaloid *Xanthoxyline*, which is identical with *Berberine*. Dose, of the powdered bark, gr. x–xxx.

Preparations.

Extractum Xanthoxyli Fluidum, *Fluid Extract of Xanthoxylum.*—Dose, ʒss-j.

Decoctum Xanthoxyli, *Decoction of Xanthoxylum* (Unofficial),—℥j to the quart. Dose, a pint during 24 hours in divided doses.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Xanthoxylum is a stimulant and aromatic bitter, a local and systemic sialagogue, also diaphoretic, diuretic and emmenagogue. Its taste is aromatic, soon becoming acrid and bitter, causing profuse salivation, tingling in the tongue and increased secretion from the stomach, intestines, liver and pancreas. It increases the cardiac action and raises the arterial tension, and is classed among the vegetable alteratives with mezereum, guaiac, stillingia, etc.

Xanthoxylum has a high reputation in chronic rheumatism, myalgia, lumbago and similar disorders, also in jaundice from catarrh of the bile-ducts, in dropsies, chronic pharyngitis and constitutional syphilis. In old cases of pharyngitis, the mucous membrane being glazed and dry, the decoction should be used as a gargle and ♏x–xxx of the fluid extract taken internally thrice daily. The bark, used as a masticatory, is a popular remedy for toothache and has been frequently successful in paralysis of the tongue.

ZEA MAYS, Maize, *Indian Corn.*—This well-known species of the nat. ord. Gramineæ, though itself unofficial, is the source of the official Starch (see AMYLUM), and of two drugs, one official, viz.—

Zea, *Corn-Silk, Stigmata Maydis,*—the styles and stigmas of *Zea Mays,* gathered when the tassels have shed their pollen. Its active principle is thought to be *Maizenic Acid.* There are no official preparations.

Extractum Zeæ Fluidum, *Fluid Extract of Zea* (Unofficial),—is made by the general rule for fluid extracts. Dose, ʒj–ij.

Ustilago, *Corn Smut* (Unofficial),—is *Ustilago Maydis,* nat. ord. Fungi, a smut grown upon the stems, the pistils and the male inflorescence (tassel) of *Zea Mays.* Its odor and taste are unpleasant, and it contains fixed oil, resin, pectin, gluten, sugar, an acid resembling the sclerotic acid of ergot, and a volatile principle called *Secaline,* which is supposed to be identical with trimethylamine.

Extractum Ustilaginis Fluidum, *Fluid Extract of Ustilago* (Unofficial),—may be prepared by the general rule for fluid extracts. Dose, ♏x–ʒj.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Zea is a certain but mild diuretic when given in full doses at short intervals. It is by some observers considered demulcent and anodyne,

ꞏnerally believed to have a specific or alterative influence over
orders of the genito-urinary passages and the urinary bladder.
en used with success for incontinence of urine, uric and phos-
avel, gout, rheumatism, urethritis, pyelitis, acute and chronic
ardiac dropsy and obstructive valvular disease of the heart.
operties of Ustilago, so far as examined, resemble those of ergot
vomica combined. It is a spinal excitant and exalts sensibility
action, producing tonic convulsions on the least irritation of
It slows the heart by stimulation of the pneumogastric, dilates
, causes muscular paresis and death by tetanus of the respiratory
r by exhaustion. Experiments on its reputed oxytocic action
substantiated the claims made for it in this respect, though it is
ve produced abortion in cows after they had eaten the diseased
s a therapeutic agent Ustilago has been very little used, but
ployed it has been as a substitute for ergot.

UM, Zinc, Zn,—is metallic Zinc, in the form of thin sheets
lar, granulated pieces, and is a bluish-white metal, having the
). It occurs native as a sulphide (*Blende*), as a Carbonate and a
Calamine), as a Red Oxide (*Zincite*), and as a mixture of Zinc
th Oxide of Iron and Manganese (*Franklinite*). Zinc is soluble
akest acids and therefore should never be used for culinary ves-
salts are all more or less actively poisonous. Metallic Zinc is
it is not employed as a medicine.

Zinc Salts and their Preparations.

cetas, *Zinc Acetate*, $Zn(C_2H_3O_2)_2 + 2H_2O$,—soft, white, micaceous or pearly,
blets or scales, somewhat efflorescent in dry air, of faintly acetous odor, sharp
te and a slightly acid reaction; soluble in 3 of water and in 36 of alcohol at
1½ of boiling water and in 3 of boiling alcohol. Used locally as an astringent
of gr. j or ij to the ℥, or internally in doses of gr. ½–ij.

arbonas Præcipitatus, *Precipitated Zinc Carbonate*,—a white, impalpable
rmanent in the air, odorless and tasteless, insoluble in water or alcohol, but
cids with copious effervescence. Used locally as a protective.

hloridum, *Zinc Chloride*, $ZnCl_2$,—a white, granular powder, or porcelain-like
rless, of intensely caustic properties; very soluble in water and in alcohol;
escent. Is tonic and escharotic. For internal use a solution in Spirit of Ether
convenient form, strength ʒj to the ℥, of which four to eight minims may
ice daily in water. Strength of injections and collyria, gr. j–ij to the ℥.

Zinci Chloridi, *Solution of Zinc Chloride*,—is an aqueous solution, contain-
o per cent. of the salt. A clear, colorless, odorless liquid, of a very astringent,
ste and an acid reaction. A powerful disinfectant for sinks, drains, etc. Used
injection in gonorrhea, leucorrhea, etc., in dilute solution, ½ to 1 per cent.
isinfecting Fluid is similar to the above but slightly stronger.

didum, *Zinc Iodide*, ZnI_2,—a white, granular powder, very deliquescent, of
e and metallic taste and acid reaction; very soluble in water and in alcohol.
s–ij in syrup.

xidum, *Zinc Oxide*, ZnO,—an amorphous, white powder, odorless and taste-
ble in water or alcohol; soluble without effervescence in dilute acids, also in
ater. Dose, gr. j–x, in pill.

Unguentum Zinci Oxidi, *Ointment of Zinc Oxide,*—has of Zinc Oxide 20, Benzoinated Lard 80.

Oleatum Zinci, *Oleate of Zinc,*—has of Zinc Oxide 5, in Oleic Acid 95. For external use.

Zinci Stearas, *Zinc Stearate,* $Zn(C_{18}H_{35}O_2)_2$ (Unofficial),—a white, insoluble powder. Not used internally.

Zinci Sulphas, *Zinc Sulphate,* $ZnSO_4 + 7H_2O$,—small colorless prisms or acicular needles, efflorescent in dry air, odorless, of sharp, saline, and metallic taste and acid reaction; soluble in 0.6 of water, insoluble in alcohol. Dose, as an emetic gr. x–xxx; as a tonic and astringent gr. $\frac{1}{16}$–ij, in pill. For *Villate's Solution,* see p. 298.

Zinci Valerianas, *Zinc Valerianate,* $Zn\ (C_5H_9O_2)_2 + 2H_2O$,—white, pearly scales, having the odor of valerianic acid, a sweetish and styptic taste and acid reaction; soluble in about 100 of water and in 40 of alcohol. Dose, gr. $\frac{1}{16}$–ij, in pill.

The **Bromide** is described under BROMUM, and the **Phosphide** under PHOSPHORUS.

PHYSIOLOGICAL ACTION.

Zinc Salts are astringents, but milder ones than the salts of lead. Its soluble compounds (the Chloride, Iodide, Sulphate and Acetate) are corrosive poisons, causing violent gastro-enteritis and in some cases profound nervous depression. The Chloride is a powerful and painful escharotic or rather mummifier of the tissues, having great affinity for water, coagulating albumin and shrivelling the vessels. It is a very active disinfectant. The Sulphate is also an escharotic and a specific emetic, acting promptly by direct irritation of the stomach, without much depression or after-nausea. In small doses it is tonic and astringent, in larger ones it would be a severe irritant but for its causing prompt emesis. The Acetate resembles the sulphate in action. The Oxide used externally is a mild, soothing astringent; used internally it enters the blood as a lactate or chloride, acting as a mild astringent and as a nervous sedative. Being almost insoluble in the stomach, it has but feeble diffusive power and consequently but slight activity. The Carbonate resembles the oxide in action. The Iodide locally is a powerful escharotic and has been supposed to possess some alterative power when given internally, in addition to its astringent qualities as a zinc salt. The Stearate is feebly antiseptic but strongly astringent. The Valerianate acts as a nervous sedative, but its properties are in all probability due to its zinc base and not to the acid combined with it.

The continued use of Zinc salts produces symptoms similar to those of chronic lead-poisoning, but of much less gravity. These salts manifest less tendency to accumulate in the system than other metallic salts and are excreted much more rapidly. Elimination takes place chiefly by the liver and intestinal glands.

The actions of the Bromide and Phosphide are described respectively [illegible] titles B[illegible] PHOSPHORUS.

Antidotes and Incompatibles.

Lime-water, mucilaginous drinks, soap, *Tannic Acid*, milk, Potassium and Sodium Carbonates, if given early, are the antidotes in poisoning by the salts of zinc. *Incompatibles* are—Lime-water, Alkalies and their carbonates, Silver Nitrate and vegetable astringents. Lead Acetate produces double decomposition with zinc salts, but it is often used in solution with the Sulphate as an injection.

THERAPEUTICS.

Zinc salts are chiefly employed in weak solution as mild astringent applications in catarrhs of mucous membranes, as conjunctivitis, gonorrhea, etc., also as unguents and lotions in skin diseases, particularly eczema, impetigo, herpes and erythema. The Chloride is made into a paste with flour and glycerin for the destruction of lupus, epithelioma and other morbid growths, also for opening abscesses in locations where puncture or incision might be dangerous. The cuticle, if unbroken, should be removed by strong water of ammonia before the paste is applied, as it will not act through the epidermic tissue. It is a commonly used disinfectant and deodorant, and in weak solution (♏ iij–v of the liquor to ℥j of water) makes a good lotion for putrid ulcers, and still weaker (gr. j–ij to the pint) is an excellent injection for gonorrhea. The Iodide is not employed as an escharotic, nor has it ever been a favorite remedy for internal use. It is chiefly employed in solution as an application to enlarged tonsils, and as an ointment (1 part to 8 of lard) for the reduction of glandular enlargements. The Sulphate is used locally as an astringent to mucous surfaces generally, internally as an emetic in narcotic poisoning and croup, and in small doses as a tonic and antispasmodic in convulsive diseases, as chorea, hysteria, epilepsy, angina pectoris, asthma, etc. In diarrheas and dysentery it is a good astringent and is frequently combined with opium and ipecac. The Acetate is used for the same purposes as the sulphate, but is usually preferred for collyria. The Oxide may be employed as a dusting powder in intertrigo, also as an ointment in eczema and excoriated surfaces generally. In combination with bismuth and pepsin it is an excellent remedy for the summer diarrhea of children, and with aromatic powder and morphine it is very efficient in gastralgia. It is a good remedy in 3-grain doses for the night-sweats of phthisis, and has been successfully employed in epilepsy and neuralgia, in whooping-cough, hysteria and nervous headache, and in bronchorrhea to check the profuse secretion. It is much employed as an ingredient of cosmetics. The Carbonate is by some preferred to the oxide for local use in skin diseases. Calamine Ointment, which is a mixture of the impure carbonate (calamine) with the oxide and an unguent basis, was until recently a favorite application as a soothing protective to abrasions and inflammations of the integument. The Valerianate has been used in such as the nervous headache of hysterical women, nervous coughs and aphonia due to uterine and ovarian irritation. The Stearate is an excellent dusting and insufflating powder, much used in rhinological practice and in the treatment of gonorrhea. It may be mixed with boric acid, europhen menthol, chrysarobin, salicylic acid, and other antiseptics, for use in intertrigo, burns, eczema, coryza, hay fever and many other local affections.

The Bromide and Phosphide are employed for the effects of their respective non-metallic bases, under which titles their uses are described.

ZINGIBER, Ginger,—is the rhizome of *Zingiber officinale*, a plant of the nat. ord. Scitamineæ, having dingy-yellow flowers on a leafless flower-stalk and long, lanceolate leaves on a separate stem. The plant is a native of Hindostan, but is cultivated in Jamaica, Sierra Leone, etc. It contains an aromatic volatile oil, and a resin.

Preparations.

Extractum Zingiberis Fluidum, *Fl. Ext. of Ginger,*—alcoholic. Dose, ♏x–ʒss.

Tinctura Zingiberis, *Tincture of Ginger,*—20 per cent. Dose, ♏xx–ʒij.

Syrupus Zingiberis, *Syrup of Ginger,*—has of the Fluid Extract 3 per cent. in sugar and water. Dose, ʒss–ij.

Trochisci Zingiberis, *Troches of Ginger,*—each troche contains of the Tincture 2 minims, with Tragacanth, Sugar and Syrup of Ginger.

Oleoresina Zingiberis, *Oleoresin of Ginger,*—is extracted by ether and contains all the virtues of the root. Dose, ♏ss–j, well diluted.

Ginger is also a constituent of Pulvis Aromaticus and Pulvis Rhei Compositus.

Ginger is sialagogue when chewed, sternutatory when inhaled and externally a rubefacient. Internally it is a grateful stimulant and carminative, produces a sensation of warmth at the epigastrium and promotes the expulsion of flatus. It is employed as a carminative in colic, as a masticatory to increase the secretion of saliva and in relaxed conditions of the throat, also internally in atonic dyspepsia, to relieve flatulence, and as an adjunct to purgative agents to correct their griping properties. The syrup is in common use as a flavoring adjuvant in prescriptions.

Ginger Beer is a favorite temperance beverage, but most of the preparations sold under its name are simply carbonated water flavored with ginger. The following recipe is furnished by Dr. William Hardman, of Blackpool, in whose family it has been used for over fifty years, and the excellence of which he guarantees:

Take 1½ oz. of the best ginger well bruised, 1 oz. of cream of tartar, and [illegible] ½ lb. of cane loaf sugar. Put all the ingredients into an earthen vessel and pour on [illegible] gallon of boiling water; when nearly cold add a gill of yeast, cover over with a blanket and let it stand in a warm place until next morning. Then skim it and run it through a filtering bag, bottle it, cork well with good corks and tie down the corks with string. In three days it will be fit for use. The bottles must be clean and sweet. A little lemon juice is considered an improvement by some. (*Lancet.*)

PART II.

PHARMACY AND PRESCRIPTION WRITING.

Pharmacy (*φάρμακον*, a drug or medicament),—may be defined as the art of selecting and preserving medicines, and preparing them for administration. It may be divided into—

Official or *Galenical Pharmacy*,—dealing with the processes and preparations of the Pharmacopœia; and—

Extemporaneous or *Magistral Pharmacy*,—which includes the operations of compounding and dispensing remedies as directed by the extemporaneous prescriptions of physicians.

PHARMACOPŒIAS AND DISPENSATORIES.

A Pharmacopœia is an official list of the drugs and their preparations recognized by the medical profession of a certain country. In foreign countries the Pharmacopœias are published under government auspices and have the force of a legal standard; in the United States its publication is left to the medical and pharmaceutical professions and it is revised every ten years by a convention called for that purpose. The official Pharmacopœias in the English languages, with the dates of their latest revision or additions, are as follows, viz.—

The Pharmacopœia of the United States of America, 7th Decennial Revision, 1890; official from January 1, 1894.

The British Pharmacopœia, 1898.

Besides the above there are—The Pharmacopœa Germanica, 1890, supplement, 1895; the Pharmacopée Française (Codex Medicamentarius), 1884, supp. 1895; the Austrian, Pharmacopœa Austriaca, 1889; Russian, Ph. Rossica, 1891; the Swedish, Ph. Suecica, 1879; the Norwegian, Ph. Norvegica, 1895; the Danish, Ph. Danica, 1893; the Belgian, Ph. Belgica, 1885; the Swiss, Ph. Helvetica, 1893; the Spanish, Farmacopea Española, 1884; the Portuguese, Ph. Portugueza, 1876; the Indian, Ph. of India, 1868; the Hungarian, Ph. Hungarica, 1888; the Netherlands', Ph. Neerlandica, 1889; the Roumanian, Ph. Romāña, 1874; the Finnish, Ph. Finnica, 1885; the Chilian, Farmaco- Chilena, 1886; the Greek, Ph. Hellenica, 1868; the Japanese, Ph. Japonica, 1891; Mexican, Neuva Farmacopea Mexicana, 1896; the Croatia-Slavonian, Ph. Croatico- a, 1888; and the Italian, Farmacopea Italiana, 1892.

A Dispensatory is a commentary on one or more pharmacopœias, giving *in extenso* the physical and medicinal history of drugs and preparations, with their doses, physiological action and therapeutics, and includes similar information about many drugs which are not official in any pharmacopœia but are of occasional use or general interest. A dispensatory is a private publication, of authority according to the reputation of its author. The principal dispensatories are American publications, and are veritable drug-encyclopædias, so elaborately do they deal with every subject embraced therein. Those of acknowledged value are—

The Dispensatory of the United States of America, by Dr. Geo. B. Wood and Dr. Franklin Bache. 18th edition, revised and largely rewritten, by Professors H. C. Wood, J. P. Remington, and S. P. Sadtler. Philadelphia, J. B. Lippincott & Co. 1899.

The National Dispensatory. 5th edition, revised by Professors Stillé, Maisch and Caspari. Philadelphia, Lea Bros. & Co. 1896.

The American Dispensatory, by King & Lloyd, Cincinnati, is the recognized authority of the "eclectic" practitioners. 18th edition, 1899.

A Companion to the U. S. Pharmacopœia, by Drs. Oldberg and Wall; New York, Wm. Wood & Co.—is an excellent book, but not so exhaustive as the others in its method of treating the subjects embraced in it.

A Companion to the British Pharmacopœia, by Peter Squire; 17th edition, London, 1899; is the nearest English approach to the American dispensatories, and is the standard text-book on the general materia medica in Great Britain. Although a very good book it does not compare as a work of reference with either of the two great American Dispensatories first above named.

WEIGHTS AND MEASURES.

The working formulæ of the U. S. Pharmacopœia of 1880 were constructed on the system of parts by weight for all articles, whether solids or fluids, except in the case of fluid extracts, for which the metric weights and measures were employed. On this system it really made no difference what unit of weight was adopted in official pharmacy. The pharmacopœia of 1890 has, however, in most cases employed definite weights for solids, and measures for liquids, in terms of the metric system. In certain cases, where weighing is decidedly more convenient or where the product is adjusted to a percentage by weight which would be rendered uncertain if the ingredients were taken by measure, liquids are ordered to be weighed. In some cases (Aqua Destillata, Aqua Aurantii Florum, etc.) the quantities are directed simply by volume. In most cases, therefore, *solids* are officially directed to be *weighed by grammes*, and *liquids* to be *measured by cubic centimeters*. At the same time, however, the weights and measures generally used by physicians in prescribing and by pharmacists in dispensing medicines, are and will doubtless continue to be, in the United States those of the Apothecaries' or Troy System of weights, (having 480 grains to the ounce and 5760 grains to the pound); and the Wine Measure. The drachm (60 grains) and the scruple (20 grains), are intermediate units of weight which are still used but are becoming obsolete.

The units of the Wine Measure are the minim (♏), which in water at its maximum density equals gr. 0.95; the fluidrachm (60 minims) and the fluidounce (8 fluidrachms or 480 minims). The signs used to denote these units are ♏ minim, ℈ scruple, ʒ drachm, ℥ ounce, and in the case of liquids an f to denote fluid is often placed before the sign, thus fʒ for fluidrachm, f℥ for fluidounce. The relations between these units of weight and measure are as follows:—

Measure.		*Weight.*	*Weight*		*Measure.*
♏j, One minim	=	0.95 grains.	grain j	=	1.05 minims.
fʒj, One fluidrachm	=	56.96 "	ʒj	=	63.20 "
f℥j, One fluidounce	=	455.69 "	℥j	=	505.60 "

Table of Troy or Apothecaries' Weight.

Pound. *Libra.* ℔		Ounce. *Uncia.* ℥		Drachm. *Drachma.* ʒ		Scruple. *Scrupulum.* ℈		Grain. *Granum.* gr.
1	=	12	=	96	=	288	=	5760
		1	=	8	=	24	=	480
				1	=	3	=	60
						1	=	20

Table of Apothecaries' or Wine Measure.

Gallon. *Congius.* C.		Pint. *Octarius.* O.		Fluidounce. *Fluiduncia.* f℥		Fluidrachm. *Fluidrachma.* fʒ		Minim. *Minimum.* ♏
1	=	8	=	128	=	1024	=	61440
		1	=	16	=	128	=	7680
				1	=	8	=	480
						1	=	60

The British Pharmacopœia recognizes only the Imperial Standard (avoirdupois) weights, having 487½ grains to the ounce, 16 ounces to the pound (instead of 12), and 7000 grains to the pound; and the Imperial Measure, having 20 ounces to the pint (instead of 16, as with us).

Table of British Pharmacopœial Weight.

Troy grain, Avoirdupois ounce and pound

Pound. *Libra.* ℔		Ounce. *Uncia.* oz.		Grain. *Granum.* gr.
1	=	16	=	7000
		1	=	437½

The Troy ounce contains 42½ grains more than the avoirdupois ounce, but the Troy pound contains 1240 grains less than the avoirdupois pound. The grain is the only unit common to both.

Table of British Imperial or Pharmacopœial Measure.

Gallon. *Congius.* C.		Pint. *Octarius.* O.		Fluidounce. *Fluiduncia.* floz.		Fluidrachm. *Fluidrachma.* fldr.		Minim. *Minimum.* min.
1	=	8	=	160	=	1280	=	76800
		1	=	20	=	160	=	9600
				1	=	8	=	480
						1	=	60

The Metric, or Decimal System of Weights and Measures, is no[illegible]w the official system in the United States, having been adopted througho[illegible]t the last revision of the U. S. Pharmacopœia. It is in general use on t[illegible]e continent of Europe and is employed by French and German physicia[illegible]s in this country. Its three standard units are as follows,—

A Meter, the standard unit of linear measure and also of the whole system, is the t[illegible]n-millionth part of the quadrant of the earth, *i. e.*, the forty-millionth part of the eart[illegible]'s circumference around the poles. One-tenth of the Meter is the Decimeter, one-hundre[illegible]th is the Centimeter, and one-thousandth is the Millimeter.

A Liter, the unit of measure of capacity, is the volume of one kilogramme of p[illegible]re water at the temperature of its maximum density, *in vacuo*. Theoretically, the Lite[illegible] is equal to one cubic decimeter, or 1000 cubic centimeters. *Per contra* one-thousandth[illegible] of a Liter is the Milliliter (or Cubic Centimeter), which measure of pure water at its ma[illegible]ximum density weighs one Gramme.

A Gramme, the unit of weight, is the weight of the one-thousandth part of a liter[illegible] of water at its maximum density. Its tenth is the Decigramme, its hundredth is the Ce[illegible]ntigramme, and its thousandth part is the Milligramme.

The original and French spelling is *metre, litre, gramme;* the Anglicized for[illegible] is *meter, liter, gram.* The U. S. Ph. of 1890 sanctions a combination of both, thu[illegible]— *meter, liter, gramme.*

The metric terms used in pharmacy are few, and are generally confin[illegible]ed to the *Gramme*, the *Cubic Centimeter* (or fluid-gramme) and the *Mi*[illegible]*lligramme;* but the system embraces many other terms of increase and [illegible]decrease, which are set forth in the following table, viz.—

		10000.	Myrialiter.		
10000.	Myriameter.	1000.	Kiloliter.		
1000.	Kilometer.	100.	Hectoliter.		
100.	Hectometer.	10.	Dekaliter.	10000.	Myriagramme.
10.	Dekameter.	**1.**	**Liter.**	1000.	Kilogramme.
1.	**Meter.**	.1	Deciliter.	100.	Hectogramme.
.1	Decimeter.	.01	Centiliter.	10.	Dekagramme.
.01	Centimeter.	.001	Milliliter (Cubic Centimeter).	**1.**	**Gramme.**
.001	Millimeter.			.1	Decigramme.
				.01	Centigramme.
				.001	Milligramme.

The relations between the Metric Weights and Measures and t[illegible] Apothecaries' are as follows,—

1 meter = 39.370432 inches.
1 liter = 2.113433 pints.
1 gramme = 15.43234874 grains.
1 grain = 0.06479895 gramme.
1 minim = 0.061613 cubic centimeter[illegible]

The Metric System is making way but slowly in this country althou[illegible]gh its progress is aided by every process of forcing which scientific bod[illegible] an bring into action, and it remains to be seen how much its adoption n the last edition of the U. S. Pharmacopœia will influence the medical rofession in its behalf. With all the influence brought to bear in its avor it certainly has not yet been adopted by any considerable propor-ion of native-born and home-educated physicians and pharmaceutists. ne of its greatest difficulties for the physician is the absence of any orrespondence or relation between the unit of weight (gramme) and the nit of measure (liter), and the consequent want of fluid denominations elow the cubic centimeter, corresponding with the decigramme, centi-ramme and milligramme of the weight scale. Its chief disadvantage is ne which is inherent to any decimal system,—that the number ten annot be divided more than once without producing a fraction. This partly compensated for by the practice of dividing five into the three arts 2, 2 and 1, and on this principle metric weights are usually con-ructed.

Approximate or **Domestic Measures** become necessary in appor-oning doses for a patient, when liquid medicines are used. Of these e measure most commonly employed is the teaspoonful, which is gen-ally taken as equivalent to a fluidrachm, though in most cases as now anufactured the teaspoon contains about 75 minims, or 25 per cent. ore than the theoretical quantity. The dessertspoonful is about equal two teaspoonsful, and the tablespoonful to about 4 teaspoonsful or ℥ss, while the wineglass is supposed to contain about f℥ij. The use of aduated medicine glasses is strongly recommended instead of these pproximate measures. They may be obtained at a trifling cost in any ell-stocked drug store.

Drops (Guttæ) are very variable in size, though popularly supposed equal minims; the variations in their relative dimensions being due to e viscidity of the liquid, the shape and surface of the orifice from which ey escape and sundry other circumstances. The Syrups and Mucilages roduce large drops, while Bromine, Chloroform and other heavy mobile quids produce very small ones. These differences are well illustrated in e following table, which gives the number of drops in a fluidrachm of veral liquids of certain classes. [See the Appendix for a fuller table.]

Syrupus Acaciæ, 44.
Syrupus Scillæ, 75.
Aqua, 60.
Liquor Potassæ, 62.
Liquor Hydrargyri Nitratis, 131.
Acetum Opii, 90.
Vinum Opii, 100.
Tinctura Opii Deodorati, 110.
Tinctura Opii Camph., 110.

Oleum Ricini, 77.
Oleum Copaibæ, 123.
Oleum Juniperi, 148.
Spiritus Camphoræ, 143.
Spiritus Chloroformi, 150.
Ext. Digitalis Fluid, 134.
Ext. Ipecac. Fluid., 120.
Ext. Cinchonæ Fluid., 138.
Ext. Zingiberis Fluid., 142.

Tinctura Opii, 130.
Tinctura Iodi, 148.
Tinctura Aconiti, 146.
Alcohol Dilutum, 137.
Alcohol, 146.
Ext. Buchu Fluid., 150.
Ext. Hyoscyami Fluid., 160.
Æther, 176.
Bromum, 250.
Chloroformum, 250.

Specific Gravity is the relative weight of equal bulks of different bodies. The specific gravity of water at a certain temperature (generally 59° F.) is taken as 1, and that of all other substances is expressed in terms of this unit. The Pharmacopœia gives very complete tables of percentages and specific gravities of Alcohol, Ammonia Water, Acetic, Hydrobromic, Hydrochloric, Nitric, Sulphuric and Phosphoric Acids, and aqueous solutions of Potassa and Soda. The specific gravity of any substance is expressed by the quotient obtained by dividing the weight of a given measure of the substance by the weight of an equal measure of water. In pharmacy the specific gravity of solids is not of any importance, but that of liquids is a matter of constant value, and is determined in most cases by means of a specific gravity bottle or by a hydrometer, instruments which are described in any standard work on chemistry or physics. Modifications of the hydrometer with scales adapted to particular work are the urinometer, saccharometer, lactometer, etc.

Specific Volume is the relative bulks of equal weights of different bodies. In pharmacy it means the volume of the weight of a liquid compared with the volume of an equal weight of water at 59° F. The specific volume of a body is therefore inversely as its specific gravity, and is expressed by the quotient obtained by dividing unity by the specific gravity. $\frac{1}{\text{sp. gr.}} = \text{sp. vol.}$ and therefore $\text{sp. gr.} \times \text{sp. vol.} = 1$.

A table of the specific gravity and specific volume of several liquids will be found in the Appendix.

PRESCRIPTIONS.

Extemporaneous Prescriptions are formulæ written on the instant (*ex tempore*) to meet the requirements of individual cases.

A prescription should begin with the name of the person for whom it is designed and the date on which it is written. Then follows the Latin word *Recipe*, usually abbreviated to the sign ℞, and signifying "Take;" next, the names and quantities of the ingredients to be used, which are also expressed in Latin; then the directions to the compounder, followed y the directions to the patient, the last being now usually expressed in nglish ; and finally the signature and address of the prescriber.

A prescription then has four component parts, as follows : the—

uperscription,—consisting of the name of the party for whom it is designed, the date and the sign ℞ signifying "Take thou."

nscription,—the body of the prescription, consisting of one or more of the following subdivisions : the—

- *Basis*,—or chief, active ingredient.
- *Adjuvant*,—to assist the action of the basis.
- *Corrective*,—to correct some injurious quality of the other ingredients.
- *Vehicle or Excipient*,—giving the prescription a suitable form.

ubscription,—the directions for the compounder, usually expressed in contracted Latin.

ignature,—the instructions for the guidance of the one administering the medicine, expressed in English, followed by the signature of the prescriber.

A prescription may, however, contain the base alone, or the base with ne adjuvant, or the base with a simple vehicle or diluent. A single ngredient may serve a double or a triple office, as the Syrupus Rhei romaticus with Quinine, in which case the syrup serves as an adjuvant increase the action of the quinine, as an excipient to cover the taste, nd as a vehicle to facilitate the administration of the dose directed. gain, the basis may need no aid in doing its work and may require no orrective of its action nor any special vehicle. On the other hand, ere is no limit to the number of ingredients which may be used, pro- ded that the prescriber has a clear idea of something to be accomplished y each one, and if there is no chemical or medicinal incompatibility etween them. In olden times prescriptions were very complex and ontained a great many curious and incongruous ingredients. As Dr. iffard well says, "the tendency of the present age is toward mono- ather than poly-pharmacy, and prescriptions with the orthodox *adjuvans* nd *corrigens* are less frequently seen than formerly." There is danger, owever, in carrying this simplicity too far, for there is no doubt but hat proper combinations of medicines will often produce effects for he patient's good which could not be obtained from the use of any one emedy.

Procedure in Writing a Prescription.

In writing an extemporaneous prescription, the first step is to write the atient's name and address, the date and the sign ℞. Then the title of ach ingredient should be written in Latin and in the genitive case, except hat when a certain number only of an ingredient is ordered the name f the ingredient should be in the accusative case, for example, "*Vitel- um unum*,—one yolk-of-egg," Next, the quantity of each ingredient ufficient for one dose should be mentally determined and multiplied by he number of doses which the mixture is to contain, and the result set down in signs and Roman numerals. The directions to the pharmacist and patient being added and the prescriber's name or initials affixed, the prescription is completed; but when very active agents are used, it is a good plan to go over the calculations a second time before letting them leave the hands of the person most responsible for the result. For pills or powders the same process should be employed, slightly varied according to the requirements of each case. Frequently the ingredients and quantities for but one pill, powder or suppository are named, with instructions to make a certain number after the formula. When an unusually large dose of any poisonous drug is prescribed, it is customary to underline the quantity, so as to call the attention of the compounder to the fact that the prescriber is aware that the dose is above the average.

An Example will perhaps make the foregoing more comprehensible, and at the same time serve to indicate the style of writing usually employed. The following formula is that ordered in the U. S. Pharmacopœia for the preparation known as *Black Draught*, but officially styled the *Compound Infusion of Senna;* approximate weights and measures being substituted for the pharmacopœial metric weights.

	For Mrs. Gray. *July 7th, 1898.* *Recipe*, Take,—	SUPERSCRIPTION.
(Basis.)	*Sennæ semiunciam,* Of Senna, half an ounce, *Magnesii Sulphatis,* Of Magnesium Sulphate,	INSCRIPTION.
(Adjuvant.)	*Mannæ, ana unciam unam,* Of Manna, of each an ounce,	
(Corrective.)	*Fœniculi, drachmam unam,* Of Fennel, one drachm,	
(Vehicle.)	*Aquæ Bullientis, fluiduncias octo,* Of Boiling Water, eight fluid-ounces.	
	Macera per horam in vase clauso, deinde cola. Macerate for an hour in a closed vessel, then strain.	SUBSCRIPTION.
	Signetur, Let it be entitled,—*A wineglassful every four hours until it operates.* *J. F. Wood, M.D.*	SIGNATURE.

Abbreviated in the style usual among physicians, the above prescription would read as follows,—

For Mrs. Gray. *July 7th, 1898.*
℞. *Sennæ,* . . . . ℥ ss.
Magnesii Sulphat.,
Mannæ, ... āā ℥ j.
Fœniculi, ... ʒ j.
Aquæ Bull., ... f℥ viij.
Mac. per hor. in vase clauso, deinde cola.
Sig.—A wineglassful every four hours, until it operates.
Wood.

As the result of the above is nearly identical with the official preparation, we might write the same prescription more simply, as follows,—

℞. *Infusi Sennæ Compos.,* ℥ viij.

with the proper superscription and signature; this being the manner of prescribing the official preparations.

It will be noticed that in the above analysis the term *basis* covers two ingredients; but it is obvious that either of them might be considered the principal agent, and the other one classed as an adjuvant.

"These four parts of a formula are intended to accomplish the object of Asclepiades, *curare cito, tute et jucunde;* in other words, to enable the basis to cure quickly, safely and pleasantly." (Pareira.)

Another Example will illustrate the mental operations which should always be followed by a prescriber; for no matter how good a memory he may have, he will surely make a grievous mistake some day if he follows the practice of writing prescriptions from memory. Furthermore, the unscientific character of the latter habit will, when appreciated, prevent any educated physician from indulging in it. Every prescription should be written with a definite purpose in view, consequently the mind of the prescriber should weigh each step carefully and should avoid all slavish subjection to ready-made formulæ.

Suppose, then, that we wish to order for Miss Graham an emulsion of Castor Oil, flavored and sweetened so as to make it less disagreeable to the taste than it naturally is. If the ingredients were simply mixed together, as in the previous example, the result would be an unsightly preparation, consisting of sweetened and flavored water with the oil floating on top. So we require that the process of emulsification be first accomplished, by which the oil is minutely subdivided and suspended in the water by the aid of the emulsifier, which may be any viscid excipient, as gum, soap, or yolk-of-egg. Taking the last-named for the emulsifying agent, we would begin by writing down in order the following terms, as stated below in italics, viz.:—

For Miss Graham. *June 10th, 1898.*
℞. (Take thou—)
Olei Ricini, (of Oil of Castor),
Vitellum, (Yolk-of-egg),
Tere bene simul; dein adde—(Rub well together; then add—)

Having gone so far, we begin to think of an agreeable vehicle, and choosing from the many Syrups at our disposal that of Ginger, and from the flavored Waters that of Cinnamon, we write further for these as the ingredients to be added, thus—

Syrupi Zingiberis, (of Syrup of Ginger),
Aquæ Cinnamomi, (of Cinnamon Water).

The ingredients are now all entered upon the prescription, but their respective quantities have not yet been decided upon. We proceed then by first taking into consideration the total quantity of the medicament required,—which, in this case, as the preparation is intended to purge the patient, need not embrace more than one or two doses. As it is well to provide for a repetition of the dose, in case the medicine should not act sufficiently, we will decide upon two doses in all. Now, the average adult dose of Castor-oil is about a tablespoonful or half-an-ounce, and as we want two such doses we insert the sign and numerals f℥j, or simply ℥j, opposite the title of the oil which is written in the genitive case. But to emulsify it properly we need about one-half as much of the emulsifying agent, and we may express this by writing for half-an-ounce of yolk-of-egg, or for the yolk of one egg, or for one yolk-of-egg, which weighs about half-an-ounce. This would be expressed in Latin by either of the following methods,—

Vitelli semi-unciam, (℥ss). One-half-ounce of Yolk-of-egg.
Vitellum ovi unius, (j). The Yolk of one egg.
Vitellum unum, (j). One Yolk-of-egg.

As the word *Vitellus* means Yolk-of-egg, we may omit the word *Ovi*, and accepting the latter as the best style, insert the numeral j opposite the word *Vitellum*, which is properly in the accusative case. The whole quantity so far specified is one ounce and a half, and if we add two and a half ounces of diluent we shall have a four-once mixture, or the full of a regular-sized bottle as found in the shops. There being considerable viscidity already present in the emulsion we do not need much syrup, so we assign to the Syrup of Ginger the odd half-ounce, leaving two ounces of the Water to make up the total bulk of four fluid-ounces.

The prescription now only requires for its completion that the subscription and signature be added. We proceed to admonish the dispenser by telling him to mix the ingredients together, writing therefore the word *Misce* or the abbreviation *M* commonly used therefor; and to further point out the nature of the preparation we add, *Let be made an emulsion*, or in Latin, *Fiat emulsum*,—the passive verb taking as predicate-nominative the thing into which the making is to be. The final direction *Label* or *Write thus*, is expressed by the term *Signetur*, *Let it be entitled*, followed by the instructions for the patient or the person who is to administer the medicine, which should be in English though they may be written in Latin. Our completed prescription will stand thus,—

For Miss Graham. *June 10th, 1898.*
℞. *Olei Ricini*, ... ℥j.
Vitellum, ... j.
Tere bene simul, dein adde—
Syrupi Zingiberis, ... ℥ss.
Aquæ Cinnamomi, ... ℥ij.
M. *Fiat emulsum.*
Sig.—"*One-half at once, to be repeated next day if required.*" *Potter.*

e last entry of the inscription might be written—*Aquæ Cinnam* *sufficiat ad* ℥iv, meaning "of Cinnamon-Water as much as y to [bring the whole quantity to] four ounces," usually ı contracted style, thus—

Aq. Cinnamomi, q. s. ad ℥iv.

: is preferred when any of the quantities are approximations, l item cannot be exactly stated to secure a certain total. In ıg case, the one yolk-of-egg might measure a little more than ıce assigned to it; but by using the *q. s. ad* style at the end, re of getting a total of exactly four fluid-ounces.

THE USE OF LATIN IN PRESCRIPTIONS.

ıf the Latin language in writing prescriptions is a sore point .in class of patients who like to know what they are taking, or ·cise their critical judgment upon the prescription of a phyıose learning, skill and judgment they professed to have conn they consulted him. This feeling crops out frequently in gislatures, where bills are periodically introduced making it a physician to write a prescription in any other than the verguage. It is well for the student to know the reasons for ; the use of a dead language in the ordinary affairs of life. ns are as follows:—

es of plants vary in every modern language, and even in the ıge several different plants not infrequently receive the same me. For example,—the name "Starwort" is given to *Aletris* l *Helonias dioica*; "Colic-root" is one of the names of *Aletris* so of *Dioscorea villosa* and *Liatris spicata*; "Mandrake" is *odophyllum* and *Mandragora*; "Winter-green" to *Chimaphila* *eria*; and "Snake-root" to five different plants,—*Asarum*, *Eryngium*, *Senega* and *Serpentaria*. There are many other this diverse nomenclature in English, and as each plant has name in French, another in German, and still another in ınish, Dutch, etc., the confusion, in so polyglot a country ld cause innumerable errors if any but a generally understood ːre used in prescriptions. Latin is such a language, it is the nguage of science throughout the world, the Latin names of efinite and cannot be confounded, and a prescription written y a physician of any nationality, in any part of the civilized be readily understood and correctly compounded by a pharıy other civilized country.

reason, formerly more potent than at present, is the protection nt which the secrecy of a Latin prescription affords. A predering mercury and potassium iodide in plain language would ard thing to send by one's child or servant to be put up, or to have ordered by telephone to be sent to Mrs. C. B. of a certain number and street. Again, there exists in many cases a strong prejudice against certain names of drugs, usually borne of ignorance but none the less potent, and in such it becomes necessary for the patient's good to conceal from him the name of the medicine he is taking. In this age of free education in all branches and the consequent smattering of everything possessed by almost everybody, the use of Latin does not afford the necessary secrecy, and the physician who does not dispense his medicines is often compelled to resort to private formulæ deposited by him with a certain druggist. In France it is a criminal offense to make known or expose the contents or nature of a prescription to any person other than the party for whom it was written, the law recognizing the fact that prescriptions may betray secrets which should be carefully guarded.

Opium, Morphine, Cocaine, and other agents likely to cause drug-habits, should never be ordered on written prescriptions for neurotic or hysterical subjects. The physician should keep such drugs in his own hands and thereby retain the absolute control of their administration in every case in which he finds it necessary to use them. He should protect his patient from such a result as drug-slavery by every means in his power. Many of the worst cases of the cocaine-habit, known to the author, were acquired by the use of cocaine in nasal sprays prescribed by physicians and similar methods are responsible for many of the wrecks made by indulgence in opium and morphine.

There is no royal road to prescription-writing; practice, care and knowledge of the whole subject are necessary to enable one to turn out habitually those elegant prescriptions which are properly termed "magistral," being the work of a *magister* or master of his business. A fair knowledge of the Latin language is a *sine qua non* to every professional man but especially to the physician. It is pitiable to see a Doctor write ignorantly of even the genitive-case endings of the drug-names which he uses. The teaching of Latin is not within the scope of this work, and this part of the subject will be concluded with the advice to the physician who is ignorant of that language to write his prescriptions wholly in English if he cannot write them in decent Latin. A very full table of the Latin words, phrases and contractions used in prescription-writing, also a table of genitive case endings, will be found in the Appendix; but for a complete treatment of the subject the reader should consult Pareira's *Selecta è Præscriptis*, in which every detail of prescription-writing is explained.

PRINCIPLES OF COMBINATION.

The principles of combination are so well laid down by Dr. H. C. Wood, that his words are appended *verbatim*, as follows:—

The art of combining medicines is not a difficult one; but in practice certain principles should not be lost sight of. Chief of these are, to prescribe as few remedies as possible, and to use no powerful drug without a very distinct idea of what it is intended to do. Whenever it is desired to give a powerful remedy in increasing doses until its physiological effect is produced, it should always be given by itself. Thus, it may be necessary to give Arsenic so as to impress the system, at the same time that Iron is indicated; but the two remedies should be given separately, so that the dose of either can be increased or diminished independently of the other. The principles of combination formulated below were long ago enunciated by Dr. Paris, but are to-day as imperative as ever. Medicines are combined—

First. To augment, correct, or modify the action of a medicine. Thus, purgatives act much more kindly when a number of them are united together. The chief reason of this probably is, that as different remedies affect different portions of the gut, the whole intestine is best reached by a union of the diverse substances. It may take an intense irritation of the mucous membrane to purge as actively as does a mild irritation of both the mucous membrane and the muscular coat.

There are powerful medicines which act similarly upon some parts of the organism but dissimilarly upon other parts. By combining such remedies powerful effects can be obtained at the points where the two lines of action cross each other, without influencing to a great extent other portions of the system. Thus, Chloral produces sleep by its action upon the brain, and also has a distinct influence upon the heart but none upon the intestinal tract. Morphine acts upon the brain and does not influence the heart, but has a powerful effect upon the intestinal tract. By combining Chloral and Morphine we get an overwhelming conjoined influence upon the brain in producing sleep with the least possible disturbance of the heart and of the intestinal tract.

Secondly. To obtain the joint action of two or more diverse remedies. Thus, in a cough mixture Morphine may be included to quiet the cough, whilst Ipecacuanha and Squill (in accordance with the first principle) are added to affect the mucous membrane. The application of this principle requires caution, or the practitioner will be led into that chief abomination—polypharmacy. It is worse than futile to attempt to prescribe for every symptom. The underlying cause of the disorder or the understratum of bodily condition must be sought out and prescribed for simply.

Thirdly. To obtain a special combination, which is really a new remedy, or which experience has shown acts almost as a new remedy. Thus, when to Iodide of Potassium in solution Corrosive Sublimate is added, a new chemical compound is formed, which experience has shown to be of great value in syphilitic diseases. Griffith's antihectic mixture is another instance of the use of chemical changes, the Proto-carbonate of Iron being formed out of the Sulphate of the metal and the Carbonate of Potassium. In the famous Dover's powder no chemical change occurs, but the ordinary action of Opium upon the skin is so enhanced that the combination may be looked upon almost as a new remedy.

Fourthly. To afford a suitable form. Thus, Acacia is added to make an emulsion or Confection of Rose to make a pill. In the choice of excipients care should be exercised to select a substance free from medical properties, having no chemical incompatibility with the medicinal agent, and of suitable physical character. Bread crumbs often make a good basis for pills, but with Nitrate of Silver they are chemically incompatible, on account of the chlorides in them.

When writing a prescription, the utmost care should be taken to use such excipients that the combination should not only be attractive to the eye, but also as little repulsive to the palate as may be. Whenever possible, the pill-form should be employed with bitter or disagreeable medicines. The pill may be readily coated with silver-foil; tonic pills may be coated with Iron by shaking or rolling them in Ferri Pulvis while soft and sticky. Sugar-coated pills and "compressed pills" are apt to get so hard and insoluble that their use requires caution. In regard to mixtures, flavoring oils should be freely used, and the power of Glycerin to conceal the disagreeable taste of many substances should be remembered. (*Wood's Therapeutics, 11th edition, page 68, et seq.*)

METRIC PRESCRIPTIONS.

Metric prescriptions are written or compounded with sufficient accuracy by considering a *Milligramme* as equal to the $\frac{1}{65}$th of a Troy grain, a *Gramme* as equivalent to 15 Troy grains, and a *Cubic Centimeter* (fluid gramme, millimeter) as equal to 15 minims or ¼th of a fluidrachm. All other metric terms, units and prefixes may be wholly ignored by the physician and the pharmacist. In fact the terms *centigramme* and *decigramme* are rarely used at all, the former being generally expressed by 10 milligrammes and the latter by 100 milligrammes. The term *Gramme* when abbreviated is printed and written *Gm.*, the term *Milligramme, Mg.*, and the term *Cubic Centimeter, Cc.* In expressing quantities by metric weight or measure in writing the common or Arabic numerals are used, and are always placed *before* the term or abbreviation designating the unit, thus—2.50 gm., 30 cc. When apothecaries' weight is employed the numerals are placed *after* the sign or symbol designating the unit, and in Roman characters, thus—gr. x, ℈ij, ʒjss, ℥vj. The decimal point after the figures representing the number of grammes or cubic centimeters should be replaced by a line, in order to avoid such errors as might arise from the misplacement of a point, the dropping of ink, or the intrusion of a fly-speck, which might cause serious results in many cases. The simplest rule for writing a prescription in metric terms by one who is not practiced in the use of the system, is the following,—

Write as though prescribing but one dose of each ingredient in grains or minims and decimals thereof; then substitute the term "grammes" or "cubic centimeters" for grains or minims, and the prescription is correct for 15 doses in metric terms.

Of course, when writing for a mixture or solution, the proper quantity of vehicle must be added to complete the one dose, and must also be expressed first in grains or minims. For example,—

		One dose.	15 doses metric.	
℞.	Quininæ Sulphatis,	gr. j,	1	
	Strychninæ Sulph.,	gr. $\frac{1}{64}$ or 0.016,		016
	Ext. Glycyrrhizæ Fl.,	♏iv,	4	
	Syrupi,	♏lx,	60	

This gives a two-ounce mixture approximately, of which the dose would be a teaspoonful.

		One dose.	15 doses metric.	
℞.	Quininæ Sulphatis,	gr. j,	1	
	Massæ Ferri Carb.,	gr. ij,	2	
	Ext. Nucis Vomicæ,	gr. ¼ or 0.25,		25

Ft. pil. no. xv. Sig.—One pill thrice daily after meals.

The above rule will answer for all liquids except those which are very heavy, as Syrups and Chloroform, or very light, as Ether. Measures may be entirely discarded, and all fluid quantities expressed in grammes. The average drop of water may be considered equivalent to 0.05 cubic-centimeter (or gramme), the average teaspoonful to 5 cc., the tablespoonful to 20 cc., the Troy ℥ to 30 grammes, the fluidounce to 30 cc., and 8 fluidounces to 250 cc.

In prescribing Syrups or Chloroform, each Troy fluidounce should be reckoned at something more than 30 grammes—say 40; and if this be done, the difficulty of converting one scale into the other will be obviated. As to Syrups, Chloroform, etc., the following table shows the actual weight in grammes of each fluidounce of the substances named:—

Fluid oz.		Water. (Grammes.)	Tinctures. (Grammes)	Syrup. (Grammes.)	Chloroform. (Grammes.)	Ether. (Grammes.)
℥i.	=	29.52	28.00	38.00	43.70	22.14
℥ii.	=	59.04	56.00	76.00	84.40	44.28
℥iv.	=	118.08	112.00	152.00	174.80	88.56
℥viii.	=	236.16	224.00	304.00	349 60	177.12

A table of equivalents between Apothecaries' and Metric Weights and Measures will be found in the Appendix.

ABBREVIATIONS.

Abbreviations, though very commonly used by physicians in prescribing, are a source of much annoyance to the compounder, and frequently one of great danger to the patient. Physicians who never knew anything of the Latin grammar, or those who have forgotten its rules, are very apt to use abbreviations to conceal their ignorance of case-endings. Many others use them through sheer laziness and some from force of habit. The educated and conscientious man will take pride in turning out a full and clear prescription, free from cabalistic letters and all elements of uncertainty. In the Appendix will be found a list of the Latin terms used in prescriptions, with the abbreviations in vogue and the English meanings. Ambiguous contractions may result fatally to the patient, as is readily seen by studying the following list, which gives a few examples of the dangers of careless abbreviation :—

Acid. Hydroc.—may mean	Acidum Hydrochloricum. Acidum Hydrocyanicum.		
Aconit.	Aconitine. Aconitum.	*Hydr.*	Hydrargyrum. Hydras. Hydriodas. Hydrochloras. Hydrocyanas.
Ammon. . . .	Ammonia. Ammoniacum.		
Aq. Chlor.	Aqua Chlori. Aqua Chloroformi.		
Aq. Fontis. . .	Might easily be read Aqua Fortis.	*Sod. Sulph.*	Sodium Sulphate. Sodium Sulphite. Sodium Sulphide.
Chlor.	Chlorine. Chloral. Chloroform.	*Sulph.*	Sulphur. Sulphide. Sulphate. Sulphite.
Hyd. Chlor. . .	Calomel. Corrosive Sublimate. Hydrate of Chloral.	*Zinci Phos.*	Zinc Phosphate. Zinc Phosphide.

RENEWALS OF PRESCRIPTIONS.

It would be advisable for physicians to always write the words *Non Repetatur*, or some similar direction, on all prescriptions which should not be repeated without their sanction. By so doing they would doubtless cut off a good many renewal charges from the receipts of druggists who would fear the legal consequences of disobeying the mandate. This inconvenience to the drug-seller would be more than compensated for in the advantage resulting to the drug-taker, who too frequently carries in his pocket-book a stock of receipts for his various complaints; and in protection to the physician, who by giving up the dispensing of his own medicines has placed it in the power of the druggist to connive at a direct robbery of the just reward of professional skill and knowledge.

It is doubtless a fact familiar to every observer, that the old-time confidential relations between the professions of physician and pharmacist have almost passed into oblivion. In fact, the tendency of pharmacy now-a-days is towards the position of a mere money-making trade, instead of in the exalted direction of a profession. The indiscriminate renewing of prescriptions, the open sale of quack nostrums and homeopathic pellets, the readiness with which counter-prescribing is indulged in, the insinuations too frequently made over the drug-counter in reflectio physicians, and many other similar practices, have caused the non- batant profession to regard the average druggist with suspicion. If sicians boldly took the dispensing of medicines more into their own h many of these evils would soon eliminate themselves from the drug-st Right here it may be said that there is nothing unprofessional or der tory in the dispensing of his own medicines by the physician. In Eng it has been the universal practice for centuries in all places except the largest cities, and it has been given up by a part of the medical profession only as a matter of convenience to themselves, not as a right belonging to the pharmacist. The homeopaths fought for the reclamation of this practice as a right belonging to the medical profession, and succeeded in securing its legality, but not from a worthy motive. They dispense their own medicines in order to cover up the many frauds of which they are daily guilty, and to give them the power of administering full doses of powerful drugs in a form which is apparently "homeopathic," with no tell-tale prescription on file in a drug-store to give mute but dangerous evidence against their honesty. In this way they administer several grains of calomel or eighth-grain doses of morphine, or correspondingly large quantities of active alkaloids, triturated with sugar of milk, or dissolved as many of the latter may be in alcohol. Chemistry, by isolating the active principles of plants, and furnishing them to commerce in the form of soluble salts, has enabled the homeopath to practice this fraudulent method of dispensing drugs, which the innocent and ignorant patient, who believes in the power of the minimum dose, supposes to be infinitesimal in amount. But the physician of the regular profession is too apt to think that if he uses a practice which charlatans have appropriated to themselves, he may be classed with them by his professional competitors. Hence, many regular physicians are absolutely afraid to use such drugs as Aconite, Belladonna, Gelsemium, Arnica, Rhus, etc., all of which are official, and most of which are older in medicine than homeopathy; and avoid pocket-cases, drachm-vials and triturations, as badges of charlatanism. It is high time that we asserted our independence in all these matters, and made use freely of those means which are recommended by our individual judgments as promotive of the best results to our patients and to ourselves. With a small stock of reliable fluid extracts, and an equally moderate supply of gelatin-coated pills and compressed tablet-triturates from the best houses, physicians could check-mate the unscrupulous practices of many druggists to a great extent, save their patients many dollars, and retain many a dollar for their own pockets which under the present system goes to their enemies. The homeopaths understand the money part of the argument well. When their patients' medicine is exhausted, the doctor must be seen for a fresh supply, meaning of course another consultation about symptoms, a change perhaps from *Mercurius Dulcis* to *Mercurius Vivus*, and another fee. The expense is nothing, sugar of milk being cheap, and there is no prescription in the patient's pocket-book, to be renewed scores of times (paying toll however every time to the druggist), and finally to be copied by aunts, mothers, and friends, as a "sovereign remedy" for a cough, or a "really wonderful receipt" for a case of croup.

PRESCRIPTION BLANKS.

After many years' experience in prescribing on blanks furnished by druggists, the writer has come to the conclusion that it is much better, for many reasons, for the physician to have his own blanks, without the address of any drug-store thereon. These blanks should be furnished with stubs on which to write the prescription at first in rough, afterwards copying it out cleanly on the main blank. A careful prescriber always writes a formula twice before letting it go out of his hands. If he does the first writing on the stub of a book of blanks he will always have a copy of the prescription in his possession, for which he may afterwards be thankful. The blank used by the writer measures 4¼ inches by 3½ inches, joined by a perforated edge to a stub 3¼ inches by 2½ inches. On the main blank the physician's name and address are printed, together with his office-hours, and a place for number and date, also the sign ℞., and a line for signature. On the stub there are printed the words, "*Copy of Prescription No. . . . . For . . . . .*"

These blanks are bound up in books of 100 each, with a flexible morocco cover, from which the book of stubs may be slipped and a fresh book inserted as required. The size is ample for all ordinary requirements, and permits of the book being carried in the breast-pocket.

INCOMPATIBILITY.

Incompatibility may be Chemical, Pharmaceutical or Therapeutical, according as the prescribed combination results in chemical decomposition, physical disassociation or antagonistic action. In the first case the incompatibility may be unintentional or intentional on the part of the prescriber, for in many cases the result of the chemical action affords the substance desired.

Instances of intentional incompatibility are the mixtures of Calomel or Corrosive Sublimate with Limewater, producing the Black and Yellow Oxides of Mercury respectively, and commonly known as *Black Wash* and *Yellow Wash*. Such a combination should not be filtered (as a novice might suppose), but should be dispensed with a Shake label in order that the precipitate may be uniformly distributed before using.

Chemical Incompatibility generally results from neglect on the part of the prescriber of the most common chemical reactions, such as that

1. Acids tend to combine with bases and to form salts.
2. Weak acids or bases are displaced from their combinations

stronger ones, so that salts in solution when brought together generally exchange their radicles, especially if by doing so an insoluble compound can be formed.

3. A salt in solution is easily decomposed by a strong alkali if the salt is one having a weak or volatile base.

4. A substance in solution may be decomposed by another without precipitation, the product being soluble in the solution.

5. Alkaloidal salts are precipitated from their solutions by the addition of fixed alkalies, their salts, or salts which produce insoluble compounds. Oxides of the fixed alkalies decompose salts of the metals proper and those of the alkaloids, precipitating their bases; but the base may be soluble in an excess of the alkali.

6. Tannic and Gallic Acids and vegetable substances containing them precipitate albumin, alkaloids and most of the metallic oxides, and form inky solutions when brought into contact with the persalts of Iron. Tannic Acid precipitates gelatin.

7. Glucosides are incompatible with free Acids or Emulsin.

Examples of the neglect of these principles are seen in the prescribing of Quinine Sulphate in mixture with Potassium Acetate, resulting in a voluminous precipitate of Quinine Acetate which cannot be poured from the bottle;—Vinegars or Syrups containing Acetic Acid (Syr. Allii, Syr. Scillæ) added to a solution of alkaline carbonates, causing decomposition of the latter with evolution of CO_2;—the addition of Liquor Potassæ to a solution of Ammonia-alum, setting free gaseous ammonia; the mixing of Strychnine Sulphate and Potassium Bromide in solution, causing the decomposition of the alkaloid sulphate and precipitation of strychnine;—preparations of Cinchona with salts of Iron, forming an inky tannate of iron;—Elixir of Chloral with Alkalies, causing the elimination of chloroform and its subsequent evaporation.

Insoluble Salts.—The following more or less Insoluble Salts will be formed whenever the materials of which they are composed are brought together in solutions:—the Hydrates, Carbonates, Phosphates, Borates, Arsenates and Tannates of most earthy and heavy metals and alkaloids, and the metallic Sulphides; the Sulphates of Calcium and of Lead, and the subsalts of Mercury; the Chlorides, Iodides, and Bromides of Bismuth, Silver, Lead, and subsalts of Mercury; the Iodides of Quinine, of Morphine, and of most alkaloids.

Instances are—Limewater or Aromatic Spirit of Ammonia with Tincture of Chloride of Iron, or solutions of Mercury salts, or neutrai solutions of Quinine or Morphine salts.

Ammonium, Potassium, and Sodium Carbonates or Bicarbonates with Limewater.

Solutions of Magnesium Sulphate, Alum, Zinc Acetate or Sulphate, with solutions of salts of Iron, Manganese, Bismuth, Antimony, Lead, and most alkaloids.

Ammonium or Sodium Phosphates with solutions of Iron Salts, with Limewater, solution of Magnesium Sulphate, of Alum, etc.

Liquor Potassii Arsenitis with Limewater, with solutions of basic salts of Iron, and with solutions of neutral salts of Quinine and Morphine, etc.

Solutions, Decoctions, Tinctures, and Extracts containing Tannic Acid with solutions of salts of Iron, Mercury, Antimony, Lead, also with solutions containing albuminous substances and Gelatin.

Limewater with solutions of Quinine or Morphine Sulphates.
Solutions of Lead Acetate with Zinc Sulphate or Alum.
Sodium Chloride with Silver Nitrate.
Morphine Hydrochlorate with Lead Acetate.
Alkaline Iodides or Bromides with Bismuth Carbonate or Subnitrate, with Lead Acetate, with Subchloride of Mercury, or with neutral solutions of Quinine, Morphine and Strychnine salts.

Table of Precipitant Solutions.

The following table shows the most important instances of solutions which mutually precipitate each other, the letter P meaning "forms a precipitate with" —

SOLUTIONS OF—	Alkaloidal Solutions (generally).	Metallic Solutions (generally).	Solutions of Lead Salts.	Solutions of Silver Salts.	Solutions of Calcium Salts.	Solutions of Magnesium Salts.	Solutions of Albumin.	Solutions of Gelatin.
Alkalies,	P	P	P	P	P	P	...	..
Tannic Acid,	P	P	P	P	...	...	P	P
Carbonic Acid and Carbonates,	P	P	P	P	P	P	...	..
Sulphuric Acid and Sulphates,	...	...	P	P	P	...	...	..
Phosphoric Acid and Phosphates,	P	P	P	P	P	P	...	..
Boric Acid and Borates,	P	P	P	P	...	...	...	..
Hydrochloric Acid and Chlorides,	...	...	P	P	...	...	...	..
Hydrobromic Acid and Bromides,	...	...	P	P	...	...	...	..
Hydriodic Acid and Iodides,	P	...	P	P	...	...	...	
Sulphides,	...	P	P	P	...	...	...	..
Arsenical Preparations,	...	P	P	P	...	...	...	..
Albumin,	...	P	P	P	...	...	...	..

Explosive Compounds result from the admixture of powerful oxidizing agents with substances which are readily oxidizable. The most important members of these two classes are as follows :—

Oxidizers.	*Oxidizable or Combustible.*
Chlorine and its Oxides.	Phosphorus. Hypophosphites.
Free Hydrochloric Acid.	Sulphur. Sulphides.
Nitro-hydrochloric Acid.	Glycerin. Sugar. Alcohols.
Chlorates. Hypochlorites.	Oils. Ethers. Tannin.
Chromates. Chromic Acid.	Cork. Charcoal. Creosote.
Permanganates.	Dry Organic Substances.
Nitric Acid. Nitrates.	Powdered Iron and Zinc.
Bromine. Bromates.	Arsenous Acid.
Iodine. Iodates.	Cyanides.
Silver Oxide.	Oxalates.
Peroxides (Dioxides).	Ferrous, Mercurous and Stannous salts.

Explosions have resulted from mixing Fluid Extract of Uva Ursi with certain samples of *Spirit of Nitre*, Chromic Acid with *Glycerin*, Potassium Permanganate with *Glycerin*, Nitric Acid with *Glycerin*, Silver Nitrate with *Creosote*, Silver Oxide in pill with *Extract of Gentian*, Potassium Chlorate with *Glycerin* and Tincture of *Ferric Chloride*. Calcium Chloride triturated with *Sulphur* in a mortar has exploded, so also has Calcium or Sodium Hypophosphite when triturated alone. Tincture of Iodine with *Ammonia* forms the Iodide of Nitrogen, which is highly explosive, especially if triturated in the presence of water. Catechu and *Potassium Chlorate* in a dentifrice have exploded in the mouth from the friction produced by a dry tooth-brush. Lozenges of *Potassium Chlorate*, carried in the pocket with a box of safety matches, have exploded by rubbing on the composition on the outside of the box, causing an extensive burn of the thigh.

Hydrogen Peroxide (Dioxide) is peculiar in that it acts both as an oxidizer and as an oxidizable agent. It reduces oxidizing agents and is itself reduced at the same time, hence it is incompatible with all the substances mentioned above. *Nitrites* may act in the same way under favorable circumstances.

Poisonous Compounds may be formed by the admixture of many substances in solution, such as—

Potassium Chlorate with *Potassium Iodide*, in solution together do not react at ordinary temperatures, but in the system they evolve a poisonous agent, probably Potassium Iodate.

Potassium Chlorate with *Syrup of Ferrous Iodide*, liberates Iodine from the Iodide in the warm stomach, causing severe gastric irritation, perhaps gastritis of dangerous degree.

Dilute Hydrocyanic Acid or Potassium Cyanide with *Calomel*, forms the Bichloride and Bicyanide of Mercury, both virulent poisons;—with *metallic hydrates*, carbonates, sub-nitrates or sub-chlorides, *cyanides* of the metals are formed which are even more poisonous than the acid itself in its usual diluted form.

Pharmaceutical Incompatibility differs from chemical incompatibility in the absence of chemical action, and is generally produced by adding one substance to another which, through differences in solubility, causes a precipitation of solid matter or a separation of part of the liquid. The separated constituents may be active and hence important, or inert and therefore unimportant.

Instances of this are—the addition of an acid to a Quinine and Liquorice mixture, resulting in precipitation of the Glycyrrhizin (relied on to cover the taste of the Quinine) by the acid; or the use of Quinine, Tincture of Ferric Chloride and Liquorice together;—or the prescribing of solutions of Chloral and Potassium Bromide with an alcoholic preparation, the Chloral separating to the top as an alcoholate, and therefore dangerously in excess for the first few doses;—or the neglect to prescribe Acacia or some other emulsifier in mixtures of an alcoholic fluid extract of a resinous body with an aqueous preparation, which would result in the separation of the resin to the surface and an overdose with the first teaspoonful.

When a fluid extract is diluted with a liquid differing in composition from those used in the fluid extracts, the gum, albumin, resin and mucilage are often separated. In such a case as Fluid Extract of Cannabis Indica the active resin would be thrown out of its alcoholic solution and floating on top might cause serious symptoms; but in many other instances the precipitate would be inert and filtration would be in order. Water is the solvent for albuminous, gelatinous, gummy and saccharine bodies and for a large number of inorganic salts; while Alcohol is the solvent for volatile oils and resins, gum-resins, resinoids, balsams and all drugs containing these as their active principles. The solvent power of either Alcohol or Water for their particular substances decreases in proportion to the amount of the other added.

Instances of Pharmaceutical Incompatibility.

Resinous Tinctures or Fluid Extracts with aqueous solutions.
Tincture of Guaiac with Spirit of Nitrous Ether.
Compound Infusion of Gentian with Infusion of Wild Cherry.
Compound Infusion of Cinchona with Compound Infusion of Gentian.
Essential Oils with aqueous liquids in quantities exceeding 1 drop to ℥j.
Fixed Oils and Copaiba with aqueous liquids (except excipients).
Tinctures made with Alcohol with those made with Diluted Alcohol.
Alcoholic Tinctures and Fluid Extracts with aqueous preparations.
Spirit of Nitrous Ether, with strong mucilages.
Infusions generally with metallic salts.

Therapeutical Incompatibility arises when two agents are administered together which oppose each other in their action on the human system,—as for instance Belladonna in any form with Physostigma. But in many cases physiological antagonists are designedly prescribed together, one as a guard against the action of the other, as in the hypodermic administration of Morphine guarded by Atropine. The antagonists to each of the active medicinal agents may be found in the section on Materia Medica under their various titles, and also in Part III, under the title POISONING. They are summarized in the table of antagonistic poisons on page 35.

The Dangers of Incompatibility may in great measure be avoided by the use of the utmost simplicity in prescribing. The subject can only be glanced at within these pages, but the following simple rules may help the burdened memory of the student and the practitioner.

Never use more than one remedy at a time, if one will serve the purpose for which you are prescribing.

Never use *Strong Mineral Acids* with other agents, unless you know exactly what reaction will ensue. They decompose salts of the weaker acids, and form ethers when combined with alcohol. Never combine *Free Acids* with hydrates or carbonates.

Select the simplest solvent, diluent or excipient you know of, remembering that the solvent power of alcohol and of water for their respective substances decreases in proportion to the quantity of the other added.

Generally do not combine two or more soluble salts; for such salts in solution, when brought together, usually exchange their radicles thereby forming an insoluble compound. [See *ante*, page 549.]

Never prescribe a drug with any of its Tests or Antidotes.

Never prescribe a *Glucoside* (as Santonin, Colocynthin, etc.) in combination with *Free Acids* or with a substance containing *Emulsin*, as these agents will decompose it.

Aconite should be ordered in water alone, *Corrosive Mercuric Chloride* by itself in water or in simple syrup. The latter drug is incompatible with almost everything, even the Compound Syrup of Sarsaparilla being to decompose it.

Potassium Iodide decomposes most of the metallic salts, and is one of e drugs which are best administered alone.

The following-named substances are incompatible with so many others at it is best to always prescribe them alone; they are best given in ple solution :—

- Alum.
- Dilute Hydrocyanic Acid.
- Dilute Nitro-hydrochloric Acid.
- Sulphuric Acid.
- Mercuric Chloride (Corr. Sub.).
- Iodine and Iodides.
- Syrup of Ferrous Iodide.
- Potassium Permanganate.
- Potassium Acetate.
- Potassium Bromide.
- Tartar Emetic.
- Tincture of Guaiac.
- Morphine Acetate.
- Morphine Hydrochlorate.
- Quinine Sulphate.
- Liquor Calcis.
- Liquor Potassæ.
- Liquor Potassii Arsenitis.
- Liquor Ferri Nitratis.
- Tinct. Ferri Chloridi.
- Zinc Acetate.
- Iron and Quinine Citrate.
- Free Chlorine in solution.
- Tannic and Gallic Acids.

Silver Nitrate and *Lead Acetate* and *Subacetate*, though incompatible th almost everything, may be combined with *Opium*, the latter forming rewith a compound which though insoluble is therapeutically active as astringent and anodyne lotion. *Silver Nitrate* with *Creosote* forms an plosive compound.

Tannic and Gallic Acids, and substances containing them (as the ringent bitters), precipitate albumin, alkaloids and most soluble tallic salts. They may be prescribed with the proto-salts of Iron, t not with its per-salts. *Calumba* is the best vegetable tonic to use h ferric salts, as it contains neither tannic nor gallic acid. *Tannic id* precipitates gelatin.

Iodine and the soluble *Iodides* are incompatible with the alkaloids and stances containing them, also with most metallic salts.

Alkalies neutralize free acids, and precipitate the alkaloids and the uble non-alkaline metallic salts. *Oxides of the Alkalies* decompose s of the metals proper and salts of the alkaloids, precipitating their es; but the base may be soluble in an excess of the alkali.

Resinous Tinctures or *Fluid Extracts*, (*e. g.*, Tinct. Cannabis Indicæ), en combined with aqueous solutions should always have Acacia or ne other emulsifying agent added, to prevent the separation of the in, which otherwise will be deposited on the sides of the bottle or will at on top of the mixture.

Tincture of Digitalis should not be mixed with aqueous or syrupy solu-ns, for in such cases precipitation or decomposition of the active inciples may occur. This tincture is injured by admixture and is best ministered on sugar or dropped on a piece of bread.

EXTEMPORANEOUS PHARMACY.

This is the most important division of the whole subject of Pharmacy, embracing as it does the preparation and dispensing of those medicines which are designed for immediate use and are compounded on the prescriptions of physicians. Hence it comprises the chief portion of the daily work of the pharmacist, and can be learned only at the dispensing counter under the personal supervision of a competent master. In the following pages are given the most important of the general directions pertaining to this subject, with the object so far as the limits of the book will admit of enabling the young medical practitioner to familiarize himself with the compounding and dispensing of drugs. The drug-store of the present day has degenerated so much from its legitimate business that ere long physicians will be compelled in self-defense to dispense their own medicines, thereby protecting themselves and their patients from the patent-medicine vending, the counter-prescribing, and the many other nefarious methods which have degraded the pharmacist from his old professional position to that of a mere trader in drugs and nostrums. The first outfit of every young doctor should include a few pharmaceutical instruments and a small stock of drugs. By the daily handling of these, the tools of his profession, he will insensibly become familiar with the technique of the art, and even if he does not continue to dispense his medicines in after years he will never regret possessing the practical knowledge which such a course will give him.

Compounding means the mixing or preparing of the drugs ordered in a prescription, and comprises all the operations of official pharmacy together with many other manipulations which will be described in their appropriate places.

Dispensing is the operation of putting up and issuing the drugs ordered in a prescription, and may apply to the already compounded preparations of official pharmacy as well as to those prepared extemporaneously.

Filling a Prescription means a combination of operations which requires great care, undivided attention, and a special practical apprenticeship at the dispensing desk. In the following discussion of extemporaneous preparations such hints are incorporated as are particularly applicable to the compounding of each article under consideration; and they may be prefaced by a few general suggestions which will serve to point out the most approved method of dealing with this important part of the druggist's work.

escription should first be slowly read over in a critical spirit, but or action of unfavorable criticism should reach the ears or eyes essenger. To shrug the shoulders when scanning the items, to even smile at the phraseology, to question the person offering it m it is for, or what complaint it is given for, are instances of rant treason to the prescriber as would justify the most complete nal ostracism of the offender. The compounder has no business with the propriety of the prescription for its purpose. It might n given as a *placebo* for reasons eminently wise and judicious; or constituted it has at least been ordered by one who is in posses- acts about which the druggist knows nothing, even if by educa- experience the latter were competent to judge in the matter, seldom is. His criticism should be directed only to the dosage pharmaceutical compatibility of the ingredients. Even in the lat- e must remember that incompatibles are often prescribed with the orming another agent from the chemical reaction produced. If that there is any mistake, or that the quantities ordered are in ee poisonous, it is his duty to make an excuse for delay to the r and at once communicate with the physician. This course, in s of telephones, is nearly always practicable.

eading the prescription, it is well to first number it and then label. This gives time for the label to dry, and avoids the use of paper, which often mars the writing and renders the directions legible.

rly defined method should next be decided on by which to com- e prescription. Directions for such plans of procedure will be the succeeding pages under the titles of the various preparations. ingredients should be carefully weighed or measured out, each g checked off so as to avoid the danger of its being duplicated. cases the excipient is not specified, its choice being left to the ; but in all such a note should be made on the prescription to article used, in order that in the event of a renewal being ordered y be no difference perceptible. No alteration or addition should which would in any degree affect the medicinal action of the ion or interfere with the intention of the prescriber.

belling of the package and the numbering and filing of the pre- are matters of mechanical detail which are best learned at the Various devices for simplifying these operations are in vogue be seen in any well-appointed drug-store. Poisonous articles druggists should always be labelled *Poison*, and the transaction in a book usually required by law to be kept for that purpose; e case of prescriptions the word "Poison" should not appear on age or label unless so directed by the prescriber.

Stock Solutions of the salts most frequently prescribed are kept in many establishments for convenience in dispensing. Those most generally used are the following :—

Alum,—℥ ijss in a quart of distilled water. Of this solution each fluidounce represents ʒ ss of the salt.

Potassium Bicarbonate,—℥j in f℥iv of distilled water; of which ℥ ss contains ʒj of the salt.

Potassium Chlorate,—1 in 24 of distilled water, will not crystallize as the temperature changes.

Potassium Bromide,—1 in 3 of distilled water, makes a very convenient solution for dispensing purposes.

Chloral Hydrate,—1 in 1 of distilled water, of which each minim contains one grain of Chloral Hydrate; or 1 in 6 of distilled water, of which each ʒ contains 10 grains.

Morphine Sulphate,—gr. xvj in ℥j of distilled water, with a grain of Salicylic Acid or 3 drops of Carbolic Acid to prevent change. Of this solution, known as Magendie's, each minim contains gr. $\frac{1}{30}$ of the salt, and ♏x contain gr. $\frac{1}{3}$. A safer solution, as it requires less mental calculation, is one of one-half the above strength, viz.—gr. viij in ℥j, of which each fluid-drachm contains gr. j of Morphine Sulphate.

Carbolic Acid,—℥j in f℥iv of glycerin, makes a convenient solution which will mix with water in all proportions. ♏ivss represent gr. j of Carbolic Acid.

Tannic Acid,—℥j in f℥iv of glycerin, dissolved by the aid of a gentle heat. ♏ivss represent gr. j of Tannic Acid.

Rules for the Pharmaceutical Student. The following rules are quoted from the *Chemist's and Druggist's Diary*, and are well worth remembering by the student :—

Read through a prescription, rapidly and in a manner suggesting no suspicion or doubt.

Write directions invariably before dispensing. Avoid thus the use of blotting paper; a good dispenser uses almost none.

If a mixture contains readily soluble ingredients, never use a mortar.

Avoid effecting solution by heat, for fear of recrystallization.

With syrups and also ingredients not water, arrange in dispensing to rinse out the measure and leave it clean; a skilled dispenser shows very little traces of his work.

Carefully clean and put away weights and scales after each operation.

Hold the scales firmly by the left hand, never lift them high above the counter, and judge of the weight as much by the indicator as by the position of the scale.

Select glass pans for scales, preferably of heavy make, and discard flimsy brass material, which corrodes speedily and becomes inaccurate.

Learn to judge of the quantity to be weighed with tolerable accuracy; train the eye as well as the hand.

If in doubt, always begin with that about which you have no doubt.

Be rapid in manipulation. Finish wrapping, tying, or sealing quickly. Slow dispensing is bad dispensing, and arises either from deficient practice or want of knowledge.

Never, when in a shadow of doubt, hesitate to ask advice from a fear of compromising your own dignity.

OFFICIAL PHARMACY.

Official Operations are those processes which are directed in the pharmacopœia to be used in the preparation of medicines. Many of them are processes which are common to both chemistry and pharmacy, as precipitation and crystallization,—while others are peculiar to pharmacy, as percolation, trituration, etc. The most important of the pharmaceutical operations are briefly described below; for full details of the various apparatus used the student is referred to the more exhaustive treatises on Pharmacy.

PHARMACEUTICAL OPERATIONS.

Carbonization is the heating of organic substances without exposure to the air until the volatile constituents are driven off, and the residue assumes the characteristic appearance of carbon.

Clarification is the separation from liquids of solid matter which prevents their being transparent, without using filters or strainers. It may be effected by heat (as in the case of Mel Despumatum), by adding a lighter liquid, by adding albumin, gelatin, milk, or paper-pulp, by fermentation, or by the subsidence of the particles in the form of a sediment through long standing.

Colation or **Straining** is usually a very simple operation, so familiar to every one of ordinary experience as to be scarcely worth describing. The strainers are made of cotton flannel, fine muslin, gauze, woolen felt and other fabrics.

Comminution is the process by which the aggregation of the particles of a solid body is overcome, and the body is reduced to pieces of varying izes. Its object is to increase the area of the surface exposed to the ction of solvents, and it includes the operations of cutting, rasping, rating, crushing, stamping, grinding, pulverizing, triturating, levigating, lutriating, granulating, etc. Apparatus of various kinds, as cutters, mortars and pestles, mills, etc., are used for the comminution, while patulas are employed to loosen the particles, and sieves to sift the coarser rom the finer. These last-named contrivances are of five sizes, designated by the number of their meshes to the inch, 80, 60, 50, 40, and o, respectively permitting the passage of powders termed very fine, fine, moderately fine, moderately coarse and coarse.

Crystallization is the process which bodies undergo in passing from he liquid or the gaseous state to the geometrical forms called *crystals*. ix systems of crystals are recognized by crystallography, which has ssumed the dignity of a separate science. Bodies which are not capable f crystallization are termed *amorphous*. Every crystallizable body ssumes its own peculiar form, or some other form derived from or reted to it. The process of crystallization is effected (1) by fusion and artial cooling, as in the cases of some metals and Sulphur; (2) by submation, as Benzoic Acid, Mercuric Chloride, etc.; (3) by deposition om hot saturated solutions while cooling; (4) by deposition from a solution during evaporation; (5) by deposition caused by passing a galvanic current through the solution; (6) by precipitation as in the case of Mercuric Iodide; (7) by the addition to the solution of a substance having a strong affinity for water, as the adding of Calcium Chloride to an aqueous solution of Sodium Chloride, or Alcohol to a solution of Potassium Nitrate or to an aqueous syrup. In a few cases amorphous solids may crystallize without undergoing liquefaction, as Sulphur, Barley-sugar and Iron wire. The methods most frequently employed are those by deposition from supersaturated solutions, and by deposition during evaporation. The more slowly the process is carried on the larger and more regular will be the crystals. The process is facilitated by use of foreign bodies as *nuclei* around which the crystals are deposited; a familiar instance being the thread in the centre of a mass of rock-candy.

The Water of Crystallization is the H_2O with which most substances combine in the act of crystallization, and the number of molecules thereof differs for each body and for the same body frequently under different conditions. *Exsiccation* is the removal of this combined water by heat, the crystals assuming thereby the form of a dry powder. *Efflorescence* is a similar process occurring spontaneously on exposure of the crystals to the air, the effloresced portion appearing as a dry powder on the surface of the crystals. *Deliquescence*, on the other hand, is the act of absorbing water from the atmosphere, a property possessed by some substances which are therefore said to be *hygroscopic*.

Decantation is the pouring or drawing off a supernatant liquid into another vessel. If done by pouring, a guiding-rod for the liquid to run on is an effective adjuvant; if by drawing, the *siphon* in some form is usually employed.

Decoloration, or the removal of coloring-matter from liquids or from solids in solution, is effected by the use of animal charcoal, which in small operations may be arranged in a funnel or a percolator, and the liquid placed thereon. It should not be forgotten that charcoal absorbs many other principles besides coloring-matter, especially alkaloids, bitters and astringents, so that the process of decoloration may be one of serious injury to the efficiency of the preparation.

Deflagration is the heating of an inorganic substance with another which yields oxygen (usually a nitrate or a chlorate), the result being the decomposition of the body with violent and sudden combustion.

Desiccation is the process of removing moisture from solids, and has for its object either the preservation of the substance, the reduction of its bulk or the facilitation of its comminution. The operation should be conducted at as low a temperature as possible. Roots, leaves and seeds are generally dried by being placed in trays of wire network and exposed to a uniform temperature in a room heated by steam. A better method is to suspend organic substances from the ceiling of an attic during warm ıer; a slow process, but one which does not result in much loss of ctive volatile principles. Crystals and precipitates require a higher erature and are usually dried on a water-bath. When the water of allization is to be expelled, as in desiccating Alum and Ferrous Sul- :, a temperature of about 400° F. is required. In absorbing water alcohol Potassium Carbonate and slaked Lime heated are employed, n several instances Sulphuric Acid is the desiccator used.

ialysis is a process by which crystallizable substances are separated non-crystallizable ones, by suspending a solution containing both a porous diaphragm having its under surface in contact with water. crystalloids pass through the diaphragm, while the non-crystalline in above it, and are termed *colloids*. Examples of the latter class ;elatin, gum, glue, starch, dextrin, albumin and extractive matters, h are generally the inert and valueless constituents of vegetable ;. Parchment-paper and bladders are used for the diaphragm; the : apparatus being termed the *dialyzer*, while the water into which the alloids pass is called the *diffusate*.

e unofficial preparation known as Dialyzed Iron (*Ferrum Dialysatum*) is a colloidal nce obtained by treating Ferric Chloride in solution with Ammonia, whereby Ferric ıte is precipitated and then dissolved by agitation. The mixture being placed on a er, the crystalloids formed (Ammonium Chloride and Ferric Chloride), together ıny free acid present, pass into the diffusate, leaving the neutral colloidal liquid ion of Ferric Oxychloride) above on the septum.

stillation consists of two processes, (1) the evaporation of a liquid, he condensation of the vapor into a liquid in a separate vessel. The t used in the first part of the operation is heat, in the second part Its object is to separate mixed volatile and fixed substances, or to ıine volatile substances which cannot otherwise be mixed, as in the ıration of some of the Waters. The apparatus used is of great variety, the simple retort and receiver to the elaborate and costly stills.

structive or **Dry Distillation** is a process of decomposing an organic substance ıt into volatile products, which are collected in a separate vessel, the residue being o be carbonized. It is employed only by large manufacturers, for the preparation etic and Succinic Acids, Oil of Amber, Wood Tar, etc.

actional Distillation is the separation by distillation of substances which are le at different temperatures, each being separately driven over and received in a by itself. Different degrees of heat are successively employed in accordance with ılatilizing points of the substances to be obtained.

xpression is the forcible separation of liquids from solids, by sub- ng them to pressure. Hand-pressure through straining-cloths may be oyed, but mechanical presses are more efficient and are coming into ral use. Oils obtained in this manner are called *expressed* or *fixed* to distinguish them from the volatile oils obtained by distillation.

Exsiccation or **Calcination** is the process of depriving a solid of its moisture or other volatile constituents by the application of heat without fusion. The term *Exsiccation* is usually applied to the vaporization of the water of crystallization from a crystalline body; *Calcination* to such operations as the expulsion of carbonic acid and water from carbonates, as in the manufacture of Lime, Magnesia, etc.

Filtration is a process of straining through a medium so fine as to deliver the filtrate in transparent condition. The filters are made of paper usually, though charcoal, asbestos, sand and other articles are sometimes employed, and are supported in a funnel of glass or other material held by the ring of a retort-stand. The best filtering-paper is made in Sweden by Munktell, and is white; but a good paper for ordinary use is the *Prat Dumas White*, which should always be employed for filtering alkaline or alkaloidal solutions. The gray French papers answer well enough for fluid extracts, tinctures or colored liquids, but should never be used for solutions containing free alkali.

Filtering-paper is folded by doubling a sheet upon itself, and then folding it again directly in the middle. When opened four distinct sections appear, one of which is separated from the other three, and the filter thus formed is placed in a funnel. This arrangement is known as a *plain filter*, which by repeated creasing is converted into the *plaited filter*; the latter being the form generally used in pharmaceutical operations of small extent. In large laboratories special processes of filtration are employed with apparatus of more or less complexity for hot filtration, rapid filtration, etc.

Fusion is the process of liquefying solids by the application of high heat without the use of a solvent. It is employed in making ointments, plasters, etc., in purifying resins, and for the purpose of decomposition. The degree of heat required varies from a temperature of 90° F., sufficient to melt lard in an open vessel, to one of 800° F., employed in fusing zinc in an earthen crucible; and may be regulated by the aid of the water-, steam- or sand-bath. The two former appliances limit the degree of heat applied, while the sand-bath prevents sudden changes in the temperature. Oil-baths and glycerin-baths are employed in fractional distillation.

Granulation is a process of reducing a coarsely crystalline substance to a granular powder, by dissolving it in water and evaporating the solution with constant stirring until the product becomes perfectly dry. Many salts are thus treated for convenience in dispensing, as the Bromide, the Iodide, the Carbonate and the Citrate of Potassium. Ferrous Sulphate, though generally dispensed in the exsiccated powder, may be granulated into minute crystals by filtering an aqueous solution of it into alcohol.

Ignition in pharmacy means the process of strongly heating solids or semi-solid substances, the residue left being the product desired. It is

the official quantitative tests for Phosphoric Acid, Ammonium
te and purified Antimony Sulphide.

eration is the heating of organic substances with access of air
carbon is consumed, the ashes being the product desired.

ration is one of the processes of extracting the soluble princi-
ı drugs, and consists in steeping the comminuted substance in a
liquid called the *menstruum*, generally alcohol, for a period vary-
ı 2 to 14 days, during which it is occasionally agitated. The
then poured off, the residue is expressed, and the mixed liquors
ed. Several of the official tinctures are prepared by this method,
y others by maceration first and percolation afterwards. A few
rinciples may be extracted by water alone (*e. g.* morphine), and
cases the addition of acids or alkalies to the water will effect the
solution of many ingredients which are insoluble in plain water.
however Alcohol is the most generally applicable of all simple
but from its hardening the cell-membranes instead of softening
revents the osmosis of their contents. Drugs subjected to alco-
other menstrua should have their cells thoroughly broken or torn,
he solvent may be brought into actual contact with the principles
d in them. The degree of disintegration required depends upon
of the cells, ducts, tubes, intercellular spaces, etc., in which the
rinciples are enclosed. A very finely powdered state is open to
ı from the packing of the particles together into an almost im-
le mass when treated by the solvent. The average size of vege-
ls is about $\frac{1}{800}$ of an inch, while resin cells and other cavities are
veraging about $\frac{1}{100}$ inch. The Pharmacopœia prescribes in each
the degree of fineness of the powdered drug employed in making
f its preparations, or its bruising, slicing, etc., when such opera-
l answer. [Compare the article on COMMINUTION on p. 557.]

lation or **Displacement** is a process of obtaining the soluble
nts of a powdered substance by the descent of a solvent through
ugh an ancient process for the making of lye from wood-ashes
on), it has only within the last forty years been adopted as an
rocess in pharmacy, but it is gradually taking the place of macera-
means of extracting the soluble principles of drugs. The vessel
old the powdered drug is called the *percolator*, of which there
y forms employed by the manufacturers. The liquid used as a
s called the *menstruum*, and when coming from the percolator it
l the *percolate*. The U. S. Pharmacopœia gives very full direc-
ncerning this process.

Precipitation is the process of separating solids from their solutions, and is usually effected by chemical reaction, though it may be accomplished by other methods, as by adding a second liquid in which the substance is insoluble, by heating albuminous solutions, or by exposing solutions of silver salts to the action of light. The most familiar example of chemical precipitation is the addition of a solution of Mercuric Chloride to one of Potassium Iodide, the result being a double decomposition of the salts and the formation of Mercuric Iodide, which falls to the bottom of the vessel as a brilliant, red, insoluble and crystalline powder. The *Precipitate* is the separated substance, which is usually thrown down, but it remains suspended in some cases, and in others it rises to the top. The *Precipitant* is the substance which is added to produce the precipitation. A *Magma* is a thick, tenacious precipitant remaining behind after the supernatant liquid is removed by decantation or otherwise. Precipitates are termed *flocculent, gelatinous, curdy, granular, crystalline,* etc., according to the forms assumed. In small operations they are usually collected on plain filters, and washed by the repeated addition of water.

Separation of liquids which do not mix with each other is a simple mechanical process performed with pipettes of various forms, or with funnels having stop-cocks in their necks. Special forms of receivers are used for the separation of volatile oils from the water which may accompany them during distillation.

Solution is the dissolving of a solid or a gaseous substance in a liquid, and may be *Simple* when the substance undergoes no alteration, being recovered unchanged on evaporation; or *Chemical* when the dissolved body is chemically altered by the solvent or some other substance present, and cannot be recovered on evaporation. Simple Syrup is an instance of simple solution, the Syrup of Lime one of chemical solution. The liquid employed is termed a *Solvent* before the substance is added to it, after the operation is completed the combined preparation is called a *Solution.* If fully charged with the dissolved substance so that it will retain no more, it is known as a *Saturated Solution.* One liquid may be dissolved in another, or a gas may be dissolved in a liquid. The solution of solids is greatly facilitated by pulverization and by stirring the menstruum. Heat generally aids solution, most substances being more soluble in hot liquids than in cold ones. A saturated solution of one substance may still be capable of dissolving others. Rapid solution of solids without chemical change causes reduction of temperature, while chemical solution produces elevated temperature. *Circulatory Solution* is performed by suspending the substance to be dissolved near the surface of the solvent in a gauze bag or on a porous shelf. The portion [illegible] on descends and produces a circulatory movement in the fluid, ıting the solution of the whole.

ents employed are chiefly Water, Alcohol, Glycerin, Acids and Oils. Others uently used are Ether, Chloroform, Benzin and Carbon Disulphide.

limation is the distillation of a volatile solid, the product being l a *Sublimate*. Its objects are to purify volatile solids from ties and to collect such as result from chemical action at high ratures. The operation is carried on in iron, glass or stoneware , and results in *Cake Sublimates* or *Powder Sublimates* according temperature of the condensing surface is high or low.

ting and **Assay** are directed by the Pharmacopœia in certain for the purpose of determining the identity and purity of its drugs eir preparations. In the main portion of the book such Tests are ntly directed, according to a specified method in each case; but ses of Assay are confined to Cinchona, Nux Vomica, Opium and f their preparations as are considered to require it. The Pharma-a contains also a very complete section on REAGENTS, in which rections are given for the preparation and use of Test solutions and etric solutions; also instructions for Gasometric estimations, and determination of the Optical Rotation of organic substances.
rmacopœial testing and the volumetric method of determination cessary to the work of the practical pharmacist, and as the appar-ed is simple and the operations are those in the line of his daily he should be familiar therewith. On the other hand the proxi-nalysis of organic substances for their principles, and the ultimate is of the same bodies for their elements, require a high degree of nd long experience, and should be left to the professional chemist.
apparatus used in testing consists of graduated flasks and jars, es, pipettes, funnels, beakers, test-tubes, capsules, crucibles, re-bottles, etc. The metric system is directed for all work, and the tus employed should be graduated accordingly.

refaction or **Roasting** is the application of heat, in a less than for carbonization, to an organic substance for the purpose difying some of its constituents, as in the roasting of coffee and of b. The latter substance, when subjected to this process, loses its tic properties, but retains its astringency, and is known as Torrefied rb.

turation is the comminution of a solid to an extremely fine powder tinued rubbing in a wedgewood mortar with an inert and gritty r, Sugar of Milk being the substance directed to be used. The product is called a Trituration (see that title under OFFICIAL PREPARATIONS). The surfaces of the mortar and pestle-head should coincide closely, and the thorough comminution of the trituration is best accomplished by a circular motion of the pestle in gradually increasing circles, until the side of the mortar is reached, then reversing the motion and gradually lessening the circles until the pestle reaches the centre again. The process is greatly facilitated by having the pestle attached to a long handle playing in an opening made in a piece of wood which is nailed at a convenient height. A weight may be fixed on top of the handle if a greater degree of friction is desired.

Pulverization by Intervention is only another name for trituration when performed in a mortar and with solid bodies, the foreign substance used being subsequently removed. Potassium Sulphate may be employed as the medium for the pulverization of Gold, and is then dissolved out with water. Alcohol or Chloroform may be added to Camphor to aid its pulverization, and then removed by evaporation. Phosphorus may be pulverized by placing it in water, gently heating the latter until the phosphorus is melted, and agitating the whole while cooling.

Levigation is trituration of a substance made into paste with water or some other liquid, and resembles the old process of grinding oil paints by hand on a slab of stone. The process is used for coarse materials, as chalk, etc., where the refuse is rejected, or for such substances as Red Mercuric Oxide, Zinc Oxide, etc. When performed with a porphyry slab and muller it is termed Porphyrization.

Elutriation is a water-sifting process for separating the coarser particles of insoluble substances from the finer. The substance is mixed with water and after the larger particles have fallen to the bottom, the liquid is decanted into another vessel, in which the light and powdery particles are collected.

Vaporization includes the various operations by which volatile matters are separated from fixed substances or from other matters which are less volatile, heat at varying temperatures being the agent used. The operations under this head are—*Evaporation*, *Distillation*, *Desiccation*, and *Sublimation*, of which the last three have been described.

EVAPORATION in pharmacy is the process by which the more volatile constituents of a liquid are driven off by heat for the purpose of reducing its volume or of purifying it, as in the preparation of extracts and fluid extracts, the crystallization of salts, etc. The vessels used should be shallow so as to expose a large surface of the liquid to the atmosphere. The heat used may be regulated by a water-bath, a steam-bath or a sand-bath, and ordinarily should be kept below but near to the boiling point of the liquid treated. As organic substances are usually injured by long heating, small portions only of vegetable preparations should be subjected to this process, and the liquid should be frequently stirred in order to hasten the operation. In large laboratories vacuum pans are employed to remove the atmospheric pressure, enabling the evaporation to be accomplished at a much lower degree of heat than if the liquid were exposed to the air. *Ebullition* or *Boiling* is a form of evaporation.

taneous Evaporation is the evaporation of a liquid without the direct applica-
heat, but at the temperature of the room or closet used for the purpose. It

ecially applicable to cases in which the residue is liable to injury or loss from much or in order to secure finer crystals than can be obtained by the quick evaporation eir solution.

ashing is a simple mechanical process for separating soluble from luble matter, by pouring upon it a liquid which will dissolve the solu- ortion. Various methods of doing this are in vogue and are often ified with very high-sounding terms, as Lotion, Affusion, Ablution, An ordinary wash-bottle, with the two glass tubes perforating the , is a convenient implement for directing a continuous stream upon cipitate, while for continuous washing a combination of bottles with nel may be used.

PREPARATIONS.

he Official Preparations may be presented under various methods assification, one of the simplest being that which divides them into ds and solids, the former being subdivided into groups named after principal bases, viz.:—

LIQUID PREPARATIONS.

ueous,—Waters, Solutions, Infusions, Decoctions, Syrups, Honeys, Mucilages, sions, Mixtures; the last five containing sweet or viscid substances.
coholic,—Fluid Extracts, Tinctures, Wines, Spirits, Elixirs.
hereal,—Oleoresins, Collodions.
eaginous,—Liniments, Oleates.
etous,—Vinegars.
Glycerines,—Glycerites.

SOLID PREPARATIONS.

Extracts.
Resins.
Masses.

Pills.
Troches.
Confections.

Powders.
Triturations.
Suppositories.

Ointments.
Cerates.
Plasters.
Papers.

the following descriptions of the pharmaceutical groups the com- ion and dosage of the various preparations are omitted, as they are detailed in the section on Materia Medica, under the title in each of the principal constituent.

PHARMACEUTICAL PREPARATIONS.

he Pharmaceutical Preparations include the pharmacopœial (official) so those of extemporaneous pharmacy (unofficial). Both classes are ribed together in alphabetical order, for the sake of easy reference.

ceta, *Vinegars*,—are solutions of the active principles of certain s in Diluted Acetic Acid. They are made by percolation and each contains the soluble principles from 10 per cent. of drug. Acidulous menstrua form soluble salts with the alkaloids and possess antiseptic qualities. The official Vinegars number 2, viz.:—

Acetum Opii.
Acetum Scillæ.

Aquæ, *Waters*,—are aqueous solutions of volatile substances, which may be solids, liquids or gases, dissolved by solution in cold or hot water, by filtration through an absorbent powder, by percolation through cotton saturated with the substance, or by distillation. The official waters number 19, including two forms of Aqua itself, viz.:—

Aqua.
Aqua Destillata.
Aqua Ammoniæ.
Aqua Ammoniæ Fortior.
Aqua Amygdalæ Amaræ.
Aqua Anisi.
Aqua Aurantii Florum.
Aqua Aurantii Florum Fortior.
Aqua Camphoræ.
Aqua Chlori.
Aqua Chloroformi.
Aqua Cinnamomi.
Aqua Creosoti.
Aqua Fœniculi.
Aqua Hydrogenii Dioxidi.
Aqua Menthæ Piperitæ.
Aqua Menthæ Viridis.
Aqua Rosæ.
Aqua Rosæ Fortior.

Of the above 5 are prepared by simple solution, 4 by passing gases through water, 3 by distillation, and 6 by trituration of the medicament with precipitated calcium phosphate, addition of water and filtration.

All waters deteriorate when long kept, microscopic plants being propagated in them from spores derived from the atmosphere. They should be prepared only in such quantities as are needed for immediate use.

Balnea, *Baths* (Unofficial). Baths are often medicated, and then become medicinal preparations. The ingredients only are ordered in a prescription, as per the following examples, each of which is intended for a bath of 20 to 30 gallons:—

Balneum Acidi Nitrohydrochlorici.

℞. Acidi Nitrici,
Acidi Hydrochlorici, . aa ℥j.
M. Sig.—Use with 30 gallons of hot water, as a bath.

Balneum Sulphuris Compositum.

℞. Sulphuris Præcip., . . . ℥ij.
Sodii Hyposulphitis, . . ℥j.
Acidi Sulphurici Dil., . ℥ss.
Aquæ, . . Oj.
M. Sig.—For a 30-gallon bath.

Capsulæ, *Capsules*, (Unofficial). Gelatin Capsules of various sizes from 0 to 10 are to be obtained from the drug-stores. They are a convenient means of administering oils or nauseous solids, and when filled may be swallowed as easily as a large pill. By some of the manufacturers *Soluble Elastic Capsules* are prepared, each containing an ordinary dose of such medicines as Castor Oil, Cod-liver Oil, etc. The largest of these capsules makes a bolus which may be swallowed with a little effort, as it is quite compressible and changes its shape to suit the calibre of the passage. The ordinary capsules are easily filled by the aid of a paper funnel, and the end of a pen-holder as a packer; but simple devices (capsule-fillers) for facilitating the operation may be purchased.

℞. Pulv. Opii, ... gr. x.
Pulv. Camphoræ, . . gr. xx.
Sacch. Alb., q. s.
Triturat., et fiant capsulæ x.
Sig.—One at bedtime for chordee; repeat in two hours if necessary.

℞. Copaibæ, ... ʒiss.
Oleoresinæ Cubebæ, . ʒss.
M., et fiant capsulæ xij.
Sig.— Two capsules to be taken three times daily, soon after meals, for gonorrhea.

Cataplasmata, *Poultices*,—are usually prepared at the residence of the patient, the ingredients only being ordered from the druggist. They are generally employed as a means of applying heat and moisture to a certain portion of the body, but are sometimes medicated with anodyne, counter-irritant or disinfectant agents. Poultices are not official in the U. S. Pharmacopœia, but are in the British, the following list including all so recognized:—

Cataplasma Carbonis, *Charcoal Poultice*,—Wood Charcoal 1, Crumb of Bread 4, Linseed Meal 3, Boiling Water 20 parts.

Cataplasma Conii, *Hemlock Poultice*,—Hemlock-juice 1, evaporated to half its volume, Linseed Meal 4, Boiling Water 10 parts.

Cataplasma Fermenti, *Yeast Poultice*,—Beer Yeast 3, Wheaten Flour 7, Water at 100° F., 3 parts.

Cataplasma Lini, *Linseed Poultice*,—Linseed Meal 2, Boiling Water 5 parts, mixed with constant stirring.

Cataplasma Sinapis, *Mustard Poultice*,—Mustard, Linseed Meal, Boiling Water and Water, of each a sufficiency.

Cataplasma Sodæ Chlorinatæ, *Chlorine Poultice*,—Solution of Chlorinated Soda 1, Linseed Meal 2, Boiling Water 4 parts.

Cerata, *Cerates*, are unctuous preparations similar to ointments, but of a much firmer consistence. They all contain Wax (Cera), and do not melt at temperatures below 104° F. They are intended for external use, and are generally spread on lint before being applied. There are 6 official Cerates, including Ceratum itself, which is made by fusing together 30 of White Wax and 70 of Lard. The composition of the others may be found in the section on Materia Medica under the appropriate titles, but the figures in parentheses below give the percentage of drug to basis in each.

Ceratum.
Ceratum Camphoræ (2).
Ceratum Cantharidis (32).
Ceratum Cetacei (10).
Ceratum Plumbi Subacetatis (5).
Ceratum Resinæ (35).

Chartæ, *Papers*,—consist of strips of paper medicated by impregnation of its fibers with medicinal substances or by being coated therewith. Of the 2 official Papers 1 is made with sized paper, and intended for external application as a vesicant or counter-irritant; the other (Charta Potassii Nitratis) is unsized paper impregnated with Nitre and intended for the inhalation of its fumes while burning. The official papers are—

Charta Potassii Nitratis.
Charta Sinapis.

Collodia, *Collodions*,—are liquid preparations having for their base a solution of Pyroxylin in a mixture of Ether and Alcohol. They are intended for external use, being applied to the skin by means of a brush, producing a film on the surface after the evaporation of the menstruum. There are 4 official Collodions, viz.:—

Collodium.
Collodium Cantharidatum.
Collodium Flexile.
Collodium Stypticum.

The Flexible Collodion contains 5 per cent. of Canada Turpentine, and 3 per cent. of Castor Oil. Styptic Collodion contains 20 per cent. of Tannic Acid.

Confectiones, *Confections*,—consist of medicinal substances formed into a mass with Sugar, Honey, Water, etc., with the object of rendering them palatable and preserving them from change. *Electuaries* are similar preparations, but this term is now obsolete. There are only two official Confections, viz.:—

Confectio Rosæ.
Confectio Sennæ.

Confections and Electuaries are very seldom prescribed, and therefore they can have but little place in extemporaneous pharmacy. A few old formulæ for such preparations are given below as pharmaceutical curiosities. The first is a meritorious prescription, the second is said to have been purchased by Lord Anson for the sum of £300.

Electuary for Piles.

℞. Potassii Bitartratis,
Potassii Nitratis,
Pulv. Jalapæ, ... aa ℥ss.
Confectionis Sennæ, . . ℥j.
Syrupi Zingiberis, q. s.
M. Fiat electuarium.

Sig.—A piece the size of a marble to be taken thrice daily.

The Chelsea Pensioner.

℞. Sulphuris Loti, ... ℥ij.
Potassii Bitart., ... ʒj.
Pulv. Rhei, ... ʒij.
Guaiaci Resinæ, ... ʒj.
Mellis Despum., . . . ℔j.
Myristicam Pulv., ... j.
M. Fiat electuarium.

Sig.—A dessertspoonful twice daily, as a laxative in chronic rheumatism.

Confectio Damocratis.

[An ingredient of Warburg's Tincture.]

This preparation was official in the London Pharmacopœia of 1745. It contained 1 grain of Opium in ℥ss, and consisted of 45 ingredients, as follows, viz.: Cinnamon, 14 parts; Myrrh, 11 parts;—White Agaric, Spikenard, Ginger, Spanish Saffron, Treacle, Mustard Seed, Frankincense and Chian Turpentine, of each 10 parts;—Camel's Hay, Costus Arabacus, Zedoary, Indian leaf, Mace, French Lavender, Long Pepper, Seeds of Harwort, Juice of ripe Cistus, strained Storax, Opponex, strained Galbanum, Balsam of Gilead, Oil of Nutmeg, Russian Castor, of each 8 parts;—Water Germunder, Balsam-tree Fruit, Cubeb, White Pepper, Seeds of Cretian Carrot, Poley Mont, strained Bdellium, of each 7 parts;—Gentian-root, Celtic Hard, Leaves of Dittany of Crete, Red Rose, Seeds of Macedonium, Parsley, Sweet Fennel Seeds, Seeds of Lesser Cardamom, Gum Arabic, Opium, of each 5 parts;—Sweet Flag, Wild Valerian, Anise-seed, Sagapenum, of each 3 parts;—Spigrul, St. John's Wort, Juice of Acacia, Catechu, Dried Bellies of Skunk, of each 2½ parts;—the roots finely powdered and the whole mixed thoroughly into a paste with Clarified Honey.

Decocta, *Decoctions*,—are made by boiling vegetable substances with water. As very few drugs contain active ingredients which are not injured by heat, these preparations have never obtained favor with scientific physicians. There are only 2 official Decoctions, viz.:—

Decoctum Cetrariæ.
Decoctum Sarsaparillæ Compositum.

The official general formula for Decoctions prescribes that when the strength is not directed by the physician, nor specified by the Pharmacopœia, they shall be prepared in the proportion of 5 grammes of the substance with 100 cc. of water; but that the strength of decoctions of energetic or powerful substances should be specially prescribed by the physician. Decoctum Cetrariæ has the aforesaid official strength, while Decoctum Sarsaparillæ Compositum has the strength of 10 per cent. as regards its principal ingredient.

Elixiria, *Elixirs*,—are sweetened, aromatic, and spirituous preparations, containing active medicinal substances in small quantities. There are but 2 official Elixirs, viz.:—

Elixir Aromaticum.
Elixir Phosphori.

The first-named is intended to represent a type of the large class of unofficial elixirs employed in manufacturing and extemporaneous pharmacy. It is practically an alcoholized syrup, flavored with Orange, and is designed for use as an excipient for extracts, tinctures, salts, etc. The Elixir of Phosphorus has about ¼ milligramme of Phosphorus to each cubic centimeter. The manufacturers have put on the market a great variety of elixirs, and most druggists keep a stock of them on hand prepared in the shop; but they may be ordered by prescription just as any other mixture would be. The substances generally used in this form are as follows:—

Arsenic.
Bismuth.
Ammonium Bromide.
Lithium Bromide.
Potassium Bromide.
Calisaya Bark.
Chloral Hydrate.
Coca.
Gentian.
Guarana.
Iron, Tincture of the Chloride.
Iron, Phosphate.
Iron, Pyrophosphate.
Liquorice.
Pepsin.
Quinine.
Strychnine.
Taraxacum.
Ammonium Valerianate.

Many of these agents may be combined with one another, as in the Elixir of Bismuth and Strychnine; Elixir of Calisaya, Iron and Strychnine; Elixir of Gentian with Tincture of Chloride of Iron; Elixir of Iron, Quinine and Strychnine, etc., etc.

Emplastra, *Plasters*,—are solid compounds, insoluble in water, of a tenacious but pliable consistence and intended for external application to limited areas of the body surface. They are prepared by incorporating medicinal substances with certain bases, which are usually Lead Plaster (Oleate of Lead), a Gum-resin, or Burgundy Pitch. The heat employed should be low so as to avoid decomposing the active agents, and should not be continued long enough to drive off any volatile constituents. The plaster mass is then spread evenly on chamois skin, kid skin or muslin.

The constituents of the following named 13 official Plasters may be found in the section on Materia Medica, under their appropriate headings.

Emp. Ammoniaci cum Hydrargyro.
Emplastrum Arnicæ.
Emplastrum Belladonnæ.
Emplastrum Capsici.
Emplastrum Ferri.
Emplastrum Hydrargyri.
Emplastrum Ichthyocollæ.
Emplastrum Opii.
Emp. Picis Burgundicæ.
Emp. Picis Cantharidatum.
Emplastrum Plumbi.
Emplastrum Resinæ.
Emplastrum Saponis.

Of the foregoing only two are directed to be spread, viz.—Emp. Capsici upon muslin, and Emp. Ichthyocollæ upon taffeta, the others having no pharmacopœial prescription for the material to be used. Plasters after being spread should remain soft, pliable and adhesive, without melting at the heat of the body. To soften the surface, if old, it should be brushed with a small quantity of Tincture of Camphor.

Plasters are rarely prepared extemporaneously, the official and many others being produced on a large scale by the manufacturers, and are kept in stock by all druggists. As a consequence the compounding and spreading of a plaster by the pharmaceutist has become a lost art. The official plasters may be ordered by prescription in the manner illustrated below. *Blisters* may be produced by the application of any preparation of Cantharides sufficiently strong for the purpose. The official Cerate of Cantharides may be spread on Adhesive Plaster (Emplastrum Resinæ), making a blistering plaster, or Cantharidal Collodion may be painted over the surface. Plasters are usually ordered by the square inch, but a diagram of the shape and size may be drawn on paper, and the plaster be directed to conform thereto, as in the first following prescription.

Emplastrum Vesicatorium.

℞. Cerati Cantharidis, q. s.
Extende supra Emplastrum Resinæ hujus formæ et magnitudinis.
Sig.—Blistering Plaster, to be applied over the region of the heart.

Counter-irritant and Anodyne.

℞. Chartæ Sinapis,
Emplas. Belladonnæ, āā 3″ x 6″—
Sig.—Apply the mustard paper first, to be followed by the plaster when the surface has been well reddened.

Emulsa, *Emulsions*,—are aqueous, liquid preparations containing an insoluble medicinal substance (as an oil or a resin) in a state of minute subdivision and suspended by the aid of some viscid excipient, as gum, which may be contained in the medicinal ingredient itself (Ammoniac, Asafœtida), or may be added by the pharmaceutist. The official Emulsions are 4 in number, all of which were classed as Mixtures in the Pharmacopœia of 1880, viz.—

Emulsum Ammoniaci.
Emulsum Amygdalæ.
Emulsum Asafœtidæ.
Emulsum Chloroformi.

Natural Emulsions comprise two classes of substances,—(1) those emulsions which exist ready formed in nature, as milk, yolk of egg, the milk juices of plants, etc., and (2) the mixtures formed by rubbing up gum-resins (as Ammoniacum, Myrrh, Asafœtida) with water. Each of these substances contains, together with its resin, enough gum to make a perfect emulsion when triturated with water. The manufactured emulsions are simply imitations of the natural ones, sufficient gum being added in case of a resinous substance to cause its suspension in the aqueous diluent.

Emulsification consists in the division of the oily or resinous substance into very minute globules, and the surrounding of each globule with a thin envelope of the excipient. If properly done the globules will remain mechanically suspended in the water, without any tendency towards recombination. Milk is the best illustration of a natural emulsion, its butter existing in the aqueous portion as very minute globules, each surrounded by a thin film of casein. Yolk of Egg is a dense emulsion, consisting of oil suspended in water by means of albumin.

The Excipients which may be used for emulsification are the following, arranged in the order of their most frequent employment, viz.—

Mucilage of Acacia,—used for oils and resins. Powdered Acacia is even better, being made into a mucilage by the process of emulsification; such a mucilage having the advantage of being perfectly fresh when incorporated with the other ingredients. To give good results the following proportions in parts by weight should be used,—

	Gum Acacia.	Water.
1 part of Fixed Oil or Copaiba requires, ...	½	¾
1 " " Balsam of Peru "	2	1½
1 " " Oil of Turpentine "	1	1

Mucilage of Tragacanth,—may also be used for oils and resins, but it has not proved so satisfactory as the preceding. The same may be said of powdered Tragacanth.

Vitellus, *Yolk of Egg*,—is an excellent agent for emulsifying oils, but mixtures made with it must be used within a few days, as they will not keep long. One yolk will emulsionize an ounce of fixed oil, and is about equal to half an ounce of Acacia. It is best suited to emulsions of cod-liver oil intended for immediate administration. The official Emulsum Chloroformi is an emulsion made with yolk of egg. *Glyceritum Vitelli* or *Glyconin* is an official preparation consisting of glycerin and yolk of egg. One ounce of it will emulsify three ounces of fixed oil.

Liquor Potassæ,—may be used for oils, the resulting compound being however a soap rather than an emulsion. Copaiba is usually emulsified by using both a gum and an alkali; a similar process being employed for many of the fixed oils.

Tincture of Senega,—will emulsify fats and oils very efficiently, even in very small quantities, ♏x emulsifying an ounce of fixed oil.

Tincture of Quillaja (Soap-bark),—is a good emulsifier of oils, and is much used in Europe for this purpose.

Milk,—is used to emulsify Scammony in the Mistura Scammonii, which is official in the British Pharmacopœia.

Syrups, Confections and **Extracts,**—may be used in making emulsions, but are rarely so employed.

Soap,—is occasionally used for emulsifying Oil of Turpentine.

The method of preparing an emulsion which experience has shown to be the best is as follows:—Add the oil, resin, etc., to a proper quantity of the excipient and mix both thoroughly in a mortar. Then add enough water to equal one-half the weight of the previous mixture, and triturate the whole rapidly and unceasingly until the emulsion is homogeneous and of a whitish color. Next, add the remainder of the water slowly, with continual stirring; finally incorporating the other ingredients, if any.

Emulsions are sometimes flavored and at the same time colored with such a preparation as the Compound Tincture of Cardamom, but they present a better appearance when perfectly white. Alcoholic preparations should not be added in large quantity to emulsions made with Acacia or Yolk of Egg, as alcohol will precipitate the emulsifying agent. Volatile Oils require admixture with a fixed oil before being made into an emulsion. Soluble salts should never be prescribed with emulsions of oils. Acids are incompatible with mixtures which have been emulsified by an alkali. Mucilage used for emulsions should always be freshly prepared.

The following examples of prescriptions for emulsions will represent those generally met with:—

Cod-Liver Oil Emulsion.

℞. Olei Morrhuæ, ... ℥ ij.
Vini Albi, ... ℥ iss.
Acidi Phosphorici Dil., . . ʒ iij.
Syrupi, ... ʒ v.
Vitellum, ... j.
Aq. Amygd. Amar., q. s. ad ℥ viij.
Misce, et fiat emulsum.
Sig.—Tablespoonful doses.

Alkaline Emulsion of Copaiba.

℞. Copaibæ,
Liq. Potassæ, ... āā ʒ ij.
Misce, et adde—
Pulv. Acaciæ,
Pulv. Sacchari, ... āā ʒ ij.
Aq. Menth. Viridis, q. s.
ad . . . . ℥ iv.
Misce, et fiat emulsum.
Sig.—Tablespoonful doses.

Extracta, *Extracts*,—are solid or semi-solid preparations obtained by evaporating solutions of vegetable principles. The drug is first powdered, then percolated with the appropriate menstruum to exhaustion. The first third of the percolate is reserved, the remainder is evaporated at a temperature not above 122° F., until its weight is ten per cent. of that of the drug used, then mixed with the reserved portion, and both are evaporated to a pilular consistence. The above is the general rule, but in several instances maceration is directed for 1 to 4 days before percolation; and in other cases, instead of reserving a portion of the percolate, the whole quantity is distilled until the alcohol is removed and the residue is evaporated to a pilular consistence. The menstrua used are,—in 6 cases Alcohol, in 13 cases Diluted Alcohol of varying strength, in 7 Water, in 1 Water with Aqua Ammoniæ, in 1 a diluted Acetic Acid, and in 2 Acetic Acid and Diluted Alcohol. One extract is an inspissated juice (Ext. Taraxaci); one is made by evaporating a fluid extract (Ext. Ergotæ), one by mixing an extract with other ingredients (Ext. Colocynthidis Comp.), and one (Ext. Glycyrrhizæ) is an ordinary commercial product.

The official Extracts number 33, and are named as follows, the letters in parentheses indicating the ingredients of the menstruum used in extraction in each case, viz.—

Extractum Aconiti (A).
Ext. Aloës (W).
Ext. Arnicæ Radicis (DA).
Ext. Belladonnæ Foliorum Alcoholicum (A_2W_1).
Ext. Cannabis Indicæ (A).
Ext. Cimicifugæ (A).
Ext. Cinchonæ (A_3W_1).
Ext. Colchici Radicis (WAc).
Ext. Colocynthidis (DA).
Ext. Colocynthidis Compositum.
Ext. Conii (DA,Ac).
Ext. Digitalis (A_2W_1).
Ext. Ergotæ (DA,Ac).
Ext. Euonymi (A_2W_1).
Ext. Gentianæ (W).
Ext. Glycyrrhizæ.
Ext. Glycyrrhizæ Purum (W).
Ext. Hæmatoxyli (W).
Ext. Hyoscyami (A_2W_1).
Ext. Iridis (A).
Ext. Jalapæ (A).
Ext. Juglandis (DA).
Ext. Krameriæ (W).
Ext. Leptandræ (A_3W_1).
Ext. Nucis Vomicæ (A_3W_1).
Ext. Opii (W).
Ext. Physostigmatis (A).
Ext. Podophylli (A_4W_1).
Ext. Quassiæ (W).
Ext. Rhei (A_4W_1).
Ext. Stramonii Seminis (DA).
Ext. Taraxaci (W).
Ext. Uvæ Ursi (A_2W_5).

The *Proximate Principles* generally present in extracts, besides the peculiar principles of plants, are Sugar, Tannin, Extractive, Chlorophyll, Coloring-matter and Salts. When an alcoholic solvent is used there are also present Resins, Fats and often a Volatile Oil, and when the menstruum is not purely alcoholic there is more or less of gum and starch. One of these ingredients, named *Extractive* or *Apotheme*, is a deposit, soluble in water and alcohol, which has the singular property of passing into an insoluble substance under the influence of the atmospheric air with heat. It also has a tendency, when precipitated from solutions, to unite with other principles carrying them down with it. It is frequently present in extracts, hence its name.

Extracta Fluida, *Fluid Extracts,*—are permanent and concentrated solutions of vegetable drugs, of uniformly definite strength if the crude drugs are so, a cubic centimeter (♏16.23) in each case representing the medicinal powers of one gramme (gr. 15.43) of the drug, or approximately a minim of the finished preparation representing the active constituents of a grain of the drug. They are officially directed to be prepared by percolation and partial evaporation, the menstrua employed being usually Alcohol, diluted Alcohol, or Alcohol and Water in various proportions, though a few are percolated with water, the alcohol being afterward added. In several instances Glycerin in different proportions is added to the first menstruum; and in the menstrua used for the fluid extracts of Conium, Ergot, Nux Vomica and Sanguinaria, Acetic Acid is an ingredient. In the preparation of the fluid extract of Prunus Virginiana, the extraction is preceded by maceration with water and glycerin, in order to permit of the formation of Hydrocyanic Acid by the reaction of the amygdalin and emulsin of the bark upon each other, which takes place only in the presence of water. The glycerin aids to keep the dissolved matters in perfect solution, and also to better retain the acid and volatile oil formed during the process. The fluid extract of Glycyrrhiza is prepared by maceration for 48 hours in a menstruum containing Ammonia-water, then by percolation, using a mixture of alcohol and water. The menstruum directed to be used in each case is intended to be that which will thoroughly extract all the active constituents of the drug and at the same time leave the inert soluble matters behind in the rejected portion, known as the *marc*. In manufacturing fluid extracts on a large scale modifications of the official processes are necessary, the methods used being generally percolation and maceration with hydraulic pressure, vacuum maceration followed by percolation, percolation with incomplete exhaustion, or repercolation.

The official Fluid Extracts number 88, and are named in the following list; the letters and figures following in parentheses showing the ingredients of their respective menstrua, by the initials of Alcohol, Diluted Alcohol, Water, Glycerin and Ammonia-water. The interrogation sign (?) signifies that the several proportions cannot be represented by figures.

Extractum Aconiti Fl. (A_3W_1).
Ext. Apocyni Fl. ($A_{65}W_{25}G_{10}$).
Ext. Arnicæ Radicis Fl. (A_2W_1).
Ext. Aromaticum Fluidum (A).
Ext. Asclepiadis Fluidum (DA).
Ext. Aspidospermatis Fl. ($A_6W_3G_1$).
Ext. Aurantii Amari Fl. (A_2W_1).
Ext. Belladonnæ Radicis Fl. (A_4W_1).
Ext. Buchu Fluidum (A).
Ext. Calami Fluidum (A).
Ext. Calumbæ Fluidum (A_3W_1).
Ext. Cannabis Indicæ Fl. (A).
Ext. Capsici Fl. (A).
Ext. Castaneæ Fl. ($A_4W_5G_1$).
Ext. Chimaphilæ Fl. (DA).
Ext. Chiratæ Fl. (A_2W_1).
Ext. Cimicifugæ Fl. (A).
Ext. Cinchonæ Fl. (AWG ?).
Ext. Cocæ Fluidum (DA).
Ext. Colchici Radicis Fl. (A_2W_1).
Ext. Colchici Seminis Fl. (A_2W_1).
Ext. Conii Fl. (DA).
Ext. Convallariæ Fl. (DA).
Ext. Cubebæ Fluidum (A).
Ext. Cusso Fluidum (A).
Ext. Cypripedii Fluidum (DA).
Ext. Digitalis Fluidum (A_2W_1).
Ext. Dulcamaræ Fluidum (DA).
Ext. Ergotæ Fluidum (DA).
Ext. Eriodictyi Fluidum (A_4W_1).
Ext. Eucalypti Fluidum (A_3W_1).
Ext. Eupatorii Fluidum (DA).
Ext. Frangulæ Fluidum (A_5W_6).
Ext. Gelsemii Fluidum (A).
Ext. Gentianæ Fluidum (DA).
Ext. Geranii Fluidum (DA_9G_1).
Ext. Glycyrrhizæ Fl. ($A_{30}W_{65}Am_5$).
Ext. Gossypii Radicis Fl. (A_3G_1).
Ext. Grindeliæ Fluidum (A).
Ext. Guaranæ Fluidum (A_3W_1).
Ext. Hamamelidis Fl. ($A_5W_4G_1$).
Ext. Hydrastis Fluidum ($A_6W_3G_1$).
Ext. Hyoscyami Fluidum (A_3W_1).
Ext. Ipecacuanhæ Fluidum (A_3W_1).
Ext. Iridis Fluidum (A).
Ext. Krameriæ Fluidum (DA_9G_1).
Ext. Lappæ Fluidum (DA).
Ext. Leptandræ Fluidum (A_3W_1).
Ext. Lobeliæ Fluidum (DA).
Ext. Lupulini Fluidum (A).
Ext. Matico Fluidum (A_3W_1).
Ext. Menispermi Fluidum (A_2W_1).
Ext. Mezerei Fluidum (A).
Ext. Nucis Vomicæ Fluidum (A_3W_1).
Ext. Pareiræ Fluidum (AWG ?).
Ext. Phytolaccæ Radicis Fl. (A_2W_1).
Ext. Pilocarpi Fluidum (DA).
Ext. Podophylli Fluidum (A_4W_1).
Ext. Pruni Virginianæ Fl. (AWG ?).
Ext. Quassiæ Fluidum (A_1W_2).
Ext. Rhamni Purshianæ Fluidum (DA).
Ext. Rhei Fluidum (A_4W_1).
Ext. Rhois Glabræ Fluidum (DA_9G_1).
Ext. Rosæ Fluidum (DA_9G_1).
Ext. Rubi Fluidum ($A_6W_3G_1$).
Ext. Rumicis Fluidum (DA).

Ext. Sabinæ Fluidum (A).
Ext. Sanguinariæ Fluidum (A_3W_1).
Ext. Sarsaparillæ Fluidum(A_1W_2).
Ext. Sarsaparillæ Fl. Co. ($A_3W_6G_1$).
Ext. Scillæ Fluidum (A_3W_1).
Ext. Scoparii Fluidum (DA).
Ext. Scutellariæ Fluidum (DA).
Ext. Senegæ Fluidum ($A_{75}W_{20}Am_5$).
Ext. Sennæ Fluidum (DA).
Ext. Serpentariæ Fluidum (A_4W_1).
Ext. Spigeliæ Fluidum (DA).
Ext. Stillingiæ Fluidum (DA).
Ext. Stramonii Seminis Fl. (A_3W_1).
Ext. Taraxaci Fluidum (DA).
Ext. Tritici Fluidum (A_1W_3).
Ext. Uvæ Ursi Fluidum ($A_2W_5G_3$).
Ext. Valerianæ Fluidum (A_3W_1).
Ext. Veratri Viridis Fluidum (A).
Ext. Viburni Opuli Fluidum (A_3W_1).
Ext. Viburni Prunifolii Fl. (A_3W_1).
Ext. Xanthoxyli Fluidum (A).
Ext. Zingiberis Fluidum (A).

In 14 instances only does the Pharmacopœia direct the making of other preparations from corresponding fluid extracts, these being the Syrups of Ipecac, Krameria, Rhubarb, Rose, Rubus, Senega, and Ginger, the Compound Syrups of Sarsaparilla and Squill, the Tincture of Ipecac and Opium, the Wine of Ipecac, the Extract of Ergot, the Liniment of Belladonna and the Mixture of Rhubarb and Soda. Notwithstanding this fact it is a common practice for dispensing pharmaceutists to make tinctures, syrups, infusions, etc., from fluid extracts; and some manufacturers put labels on the bottles containing their fluid extracts, giving the formulæ for so preparing other preparations. This practice is illegitimate and tends still further to degrade the profession of pharmacy into a mere trade, so far as dispensing is concerned.

A large number of unofficial fluid extracts are manufactured and for sale, one firm alone carrying over 400 such on its catalogue. **Normal Liquids** are a class of superior fluid extracts introduced by Parke, Davis & Co., which are claimed to be adjusted to a maximum strength by accurate assays for alkaloidal strength made at each stage of their manipulation, irrespective of the amount of material required, which in the case of official fluid extracts is prescribed by the Pharmacopœia, regardless of the varying quality of drugs in the market. This firm prepares Normal Liquids of Aconite, Veratrum Viride, Belladonna (root or leaves), Cannabis Indica, Cinchona, Calisaya, Cinchona Rubra, Colchicum (root or seed), Conium, Ergot, Digitalis, Gelsemium, Hyoscyamus, Ipecacuanha, Podophyllum, Nux Vomica, Rhubarb, and Stramonium (seed or leaves). Of these preparations one cubic centimeter is equivalent to one gramme of the corresponding drug of standard alkaloidal strength. A fluid extract of Belladonna leaves may contain 0.25 or 0.45 per cent. of Atropine, according to the quality of the drug employed; a Normal Liquid will contain invariably 0.4 per cent. of the alkaloid, so that in a given dose it may be relied upon to produce a certain effect.

Gargarisma, *A Gargle* (Unofficial),—is a mixture or solution for application to the pharynx or to the mouth (mouth-wash). It should not contain any very active drug, which would produce dangerous symptoms if swallowed, or any agent which would injure the teeth or the mucous membrane. Gargles are ordered and compounded in the same manner as mixtures. They usually contain astringent or disinfecting salts (Alum, Borax, Potassium Chlorate, Zinc Sulphate), with a vegetable astringent and often honey. The following formulæ will illustrate prescriptions of this class:—

℞. Tr. Guaiaci Ammoniatæ,
Tr. Cinchonæ Comp., aa ℥ss.
Mellis Despumat., . . ʒjss.
Bene simul agita, et adde—
Potassii Chloratis, . . . ʒijss.
Aquæ, q. s., *ad* . . . . ℥viij.
Fiat gargarisma. Sig.—Gargle.

℞. Aluminis, ... ʒij.
Granati Corticis, . . . ʒiv.
Petal. Rosæ Rubr., . . ℥j.
Mellis Despumat., . . . ℥j.
Aquæ Bullientis, . . . ℥vj.
M. Sig.—Gargle.
(*Goddard.*)

Glycerita, *Glycerites*,—are mixtures of medicinal substances with Glycerin, in which some of them are dissolved. They are very useful preparations for dispensing purposes, as they can be readily diluted with water or alcohol without precipitation. There are 6 official Glycerites, the figures following their names in the list below indicating the percentage of drug in each. The Glycerite of Starch contains 10 per cent. of water, and that of Hydrastis has for its menstruum a mixture of glycerin, alcohol and water.

Glyceritum Acidi Carbolici, 20.
Glyceritum Acidi Tannici, 20.
Glyceritum Amyli, 10.
Glyceritum Boroglycerini, 31.
Glyceritum Hydrastis, 100.
Glyceritum Vitelli, 45.

Haustus, *A Draught* (Unofficial),—is an extemporaneous mixture consisting of a single dose, and usually ordered in a vial containing from one to two fluidounces.

Effervescing Draught is one of the best known. It is prepared by neutralizing a watery solution of Potassium Bicarbonate with Lemon-juice or Citric Acid, and may be drank during effervescence. When the CO_2 has escaped it is a solution of Potassium Citrate in water, and corresponds to the official Liquor Potassii Citratis.

Black Draught is another well-known preparation of this class. It is official as Infusum Sennæ Compositum.

Infusa, *Infusions*,—are prepared by treating vegetable substances with hot or cold water without boiling. Cold water is preferred when the drug contains a desirable volatile principle, or when its active ingredient is injured by heat. The drug should be coarsely comminuted, sliced or bruised, and treated by maceration or percolation with the proper quantity of water, which in the absence of specific directions to the contrary should be 5 parts by weight of the drug to 100 of water, or 5 grammes in 100 cc. Infusions should be freshly made as required for they are very prone to decomposition. Those official number 4 and are named in the following list, the figure after each representing the percentage of drug to menstruum, viz.—

Infusum Cinchonæ, 6.
Infusum Digitalis, 1½.
Infusum Pruni Virginianæ, 4.
Infusum Sennæ Compositum, 6.

The last-named infusion contains also 12 per cent. each of Manna and Magnesium Sulphate and 2 of Fennel. The infusion of Cinchona has of Aromatic Sulphuric Acid 1 per cent. Alcohol, in the proportion of 10 per cent. is an ingredient of the Infusion of Digitalis to prevent decomposition.

Many dispensing pharmaceutists are in the habit of making infusions from concentrated alcoholic tinctures or from fluid extracts. It is a very reprehensible practice, especially in those cases where the active ingredients are of a resinous nature and therefore precipitate when the alcoholic solution is added to water.

Inhalationes, *Inhalations,* and **Vapores,** *Vapors* (both Unofficial), are medicines in the form of a vapor, a gas or an atomized spray, to be inhaled by the patient for their local action on the respiratory tract. The well-known steam-atomizer is the agent by which most of these preparations are administered, though many substances may be inhaled from the surface of hot water, from a sponge in a bottle surrounded by a hot cloth, or from a heated shovel. They are prescribed in the usual manner, as follows:—

Stimulant Inhalation.

℞. Olei Cubebæ, ... ʒij.
Magnesii Carbonat., . . ʒj.
Aquæ, ... ℥iij.
M. Sig.—A teaspoonful in a pint of water at 150° F., for each inhalation.

Oil of Pine.

℞. Ol. Pini Sylvestris, . . ʒij.
Magnesii Carb., ... ʒj.
Aquæ, ... ℥iij.
M. Sig.—A teaspoonful on a pint of hot water for each inhalation.

Carbolized Inhalation.

℞. Acidi Carbolici, ... ♏xlviij.
Aquæ, q. s. ad . . . . ℥ij.
M. Sig.—Use one-half in the cup of a steam-atomizer for each inhalation.

Tar and Turpentine.

℞. Ol. Picis Liquidæ,
Ol. Terebinth., . . aa ℥ij.
M. Sig.—Pour slowly on a hot shovel in the sick-room, keeping the vapor confined therein.

The official Charta Potassii Nitratis (Nitre-paper), is a preparation intended for use as an inhalation, its vapors while burning being taken into the lungs.

Injectiones, *Injections* (Unofficial),—are liquid preparations intended for introduction into the cavities of the body by means of a syringe. When thrown into the rectum they are termed *Enemata* (Enemas or Clysters), and are usually prepared at the bedside. Enemata may be demulcent, laxative, nutritive, stimulant or vermifuge in character; and always have warm or tepid water as their diluent, with which are incorporated such medicaments as may be desired. They may consist simply of water to act as a wash for the cleansing of the bowel. Injections are termed vaginal, urethral, vesical, nasal, hypodermic, etc., according to the locality in which they are employed. A special form of syringe is employed in each case, the discussion of which belongs rather to the domain of surgery than to that of medicine. Those used for the nasal cavities are often arranged with small holes or an atomizing attachment, so as to deliver the injection in the form of a fine spray. A *Collunarium* is a nasal douche or wash. In the Appendix will be found a list of formulæ for hypodermic injections; a few prescriptions for other forms are appended below.

Enema for Stricture of the Rectum.

℞. Bismuthi Subcarb., . ℥j.
Extracti Opii, ... gr. ij.
Glycerini, Aquæ, . . āā ℥ij.

M. Fiat enema. Sig.—Two tablespoonfuls to be injected thrice weekly.

Demulcent Enema.

℞. Tincturæ Opii, ... ♏xx.
Decocti Amyli, ... ℥iv–vj.

M. Fiat enema.

Vermifuge Enema.

℞. Extr. Quassiæ Fl., . . ℥jss.
Aquæ, ... ℥ijss.

M. Sig.—A tablespoonful with an equal quantity of warm water, as an enema, to be retained as long as possible.

Nasal Injection (Dobell's).

℞. Acidi Carbolici, ... ʒjss.
Sodii Bicarb.,
Sodii Boratis, ... āā ʒiv.
Glycerini, ... ʒxivss.
Aquæ, q. s. ad . . . . . ℥viij.

M. Sig.—A tablespoonful diluted with an equal quantity of tepid water to be used thrice daily with a nasal sprayer.

Injection for Gonorrhea.
(Injection Brou.)

℞. Zinci Sulphatis, ... gr. viij.
Plumbi Acetatis, . . . gr. xv.
Tincturæ Opii, ... ʒij.
Tinct. Catechu, ... ʒj.
Aquæ Rosæ, q. s. ad . . ℥vj.

M. Fiat injectio. Sig.—Use with a urethral syringe.

Injection for Chronic Urethritis.

℞. Hydrarg. Chl. Corrosivi, gr. ¼.
Zinci Chloridi, ... gr. ss.
Aquæ Destillatæ, . ℥viij.

M. Sig.—A tablespoonful to be injected well down into the urethra thrice daily, through a gum catheter.

Vaginal Injections for Leucorrhea.

℞. Aluminis, ... ʒj.
Zinci Sulphatis, ... ʒss.
Sodii Boratis, . . gr. iv.

M. Sig.—Dissolve in half-a-pint of warm water, and use with a vaginal syringe.

℞. Acidi Tannici, ... ℥j.
Glycerini, ... ℥iv.

M. Sig.—One-half with an equal quantity of water to be injected twice daily.

Linimenta, *Liniments,*—are very thin ointments for external application, intended to be applied with friction to the skin. They are solutions of various substances in oily liquids or in alcoholic liquids containing fatty oils. Of the following 9 official Liniments 2 have as their basis Cotton-seed Oil, 1 Linseed Oil, 1 Oil of Turpentine, 1 Alcohol, and 3 Alcohol and Water.

Linimentum Ammoniæ.
Linimentum Belladonnæ.
Linimentum Calcis.
Linimentum Camphoræ.
Linimentum Chloroformi.
Linimentum Saponis.
Linimentum Saponis Mollis.
Linimentum Sinapis Compositum.
Linimentum Terebinthinæ.

Besides the above, (except Lin. Saponis Mollis), the Br. Phar. contains Lin. Aconiti, Lin. Camphoræ Comp., Lin. Crotonis, Lin. Hydrargyri, Lin. Iodi, Lin. Opii, Lin. Potassii Iodidi cum Sapone, and Lin. Terebinthinæ Aceticum.

Extemporaneous Liniments may correspond to the official ones or they may be simple mixtures of fluids without either fat or soap. A prescrip- for each kind is appended. The official Linimentum Saponis (Soap basis for extemporaneous preparations of this class.

Compound Chloroform Liniment.

℞. Ext. Belladon. Rad. Fl., . ℥ss.
Ext. Aconiti Fl.,
Chloroformi Venalis, . . āā ʒij.
Spiritus Camphoræ, . . . ℥j.
Alcoholis Diluti, q. s. ad . ℥viij.
M. Fiat linimentum.
Sig.—Poison. To be rubbed on the painful part.

Anodyne Liniment.

℞. Tinct. Aconiti, ... ʒij.
Tinct. Opii, ... ℥iv.
Tinct. Arnicæ, ... ℥j.
Chloroformi, ... ʒij.
Linim. Saponis, q. s. ad . ℥iv.
M. Fiat linimentum.
Sig.—Poison. Liniment.

Stokes' Liniment.

℞. Olei Terebinthinæ, ... ℥iij.
Acidi Acetici, ... ℥ss.
Olei Limonis, ... ʒj.
Vitellum, ... j.
Aquæ Rosæ, ... ℥iij.
M. Fiat linimentum.
Sig.—Liniment.

Army Medical Wagon Liniment.

℞. Liq. Ammoniæ,
Ol. Terebinthinæ,
Ol. Olivæ,
āā, partes æquales.
M. Fiat linimentum.
Sig.—Liniment.

An Embrocation is a similar preparation, but of thinner consistence. The term is almost obsolete.

Liquores, *Solutions*,—comprise all aqueous solutions of non-volatile substances, except the syrups, infusions and decoctions, which naturally form distinctive classes. There are 24 official solutions, 7 of which are *simple* aqueous solutions of the medicament, the rest being *chemical* aqueous solutions, in which the dissolved substances are altered by chemical action and new ones formed. They are named as follows:—

Liquor Acidi Arsenosi.
Liquor Ammonii Acetatis.
Liquor Arseni et Hydrargyri Iodidi.
Liquor Calcis.
Liquor Ferri Acetatis.
Liquor Ferri Chloridi.
Liquor Ferri Citratis.
Liquor Ferri et Ammonii Acetatis.
Liquor Ferri Nitratis.
Liquor Ferri Subsulphatis.
Liquor Ferri Tersulphatis.
Liquor Hydrargyri Nitratis.
Liquor Iodi Compositus.
Liquor Magnesii Citratis.
Liquor Plumbi Subacetatis.
Liquor Plumbi Subacetatis Dilutus.
Liquor Potassæ.
Liquor Potassii Arsenitis.
Liquor Potassii Citratis.
Liquor Sodæ.
Liquor Sodæ Chloratæ.
Liquor Sodii Arsenatis.
Liquor Sodii Silicatis.
Liquor Zinci Chloridi.

Lotio, *A Lotion* or *Wash* (Unofficial),—is a solution or mixture of medicinal agents, intended for external application; usually consisting of some soluble, astringent salt, dissolved in water, with perhaps some glycerin or alcohol. A Fomentation (*Fotus*) is a similar preparation used hot. A *Collyrium* is an eye-wash, and generally contains a soluble astringent salt dissolved in rose-water or distilled water, in the proportion of gr. j–iv to the ℥. The only official preparation suitable for a lotion is the Liquor Plumbi Subacetatis Dilutus (Lead-water). A well-known anodyne, refrigerant and astringent lotion is that represented by the upper two of the following prescriptions.

Lead-water and Laudanum.

℞. Liq. Plumbi Subacetatis, . ʒj.
Tinct. Opii, ... ℥j.
Aquæ, q. s. ad . . . . . ℥viij.
M. Fiat lotio. Sig.—Lotion.
(*Gross.*)

Collyrium.

℞. Sodii Boratis, ... gr. x.
Aquæ Camphoræ, ... ʒij.
Mucil. Cydonii,
Aquæ Destil., ... āā ℥ss.
M. Fiat collyrium. Sig.—Eye-water; a few drops to be put into the eye three or four times daily.

Lead and Opium Wash.

℞. Liq. Plumbi Subacetatis,
Tinct. Opii, ... āā ℥j.
Aquæ, q. s. ad . . . . . . ℥viij.
M. Fiat lotio. Sig.—Lotion.
(*Sturgis.*)

Collyrium of Four Sulphates.

℞. Zinci Sulphatis,
Ferri Sulphatis,
Cupri Sulphatis,
Aluminis, ... āā gr. j.
Aquæ Destillatæ, ... ℥j.
M. Fiat collyrium. Sig.—For use with brush to palpebral conjunctivæ, and to be washed off with clean water.

Massæ, *Masses,*—are Pill-masses prepared as described under the subtitle PILULÆ. The official Masses number 3, viz.—

Massa Copaibæ. Massa Ferri Carbonatis. Massa Hydrargyri.

Mellita, *Honeys,*—differ from syrups merely in their being prepared with honey as a base. The *Oxymel* and *Oxymel Scillæ* of the B. P. are similar preparations, containing also Acetic Acid. There are 3 official Honeys, including two forms of honey itself, viz.—

Mel. Mel Despumatum. Mel Rosæ.

Misturæ, *Mixtures,*—in official pharmacy are aqueous preparations of *insoluble* substances held in suspension by a suitable vehicle. In extemporaneous pharmacy the term mixture has a wider signification, as explained below. Mixtures are generally prepared extemporaneously upon prescriptions, as few of them are of the stability necessary to insure their preservation beyond a few days. The official mixtures are 4 in number, and are named as follows,—

Mistura Cretæ.
Mistura Ferri Composita.
Mistura Glycyrrhizæ Composita.
Mistura Rhei et Sodæ.

In extemporaneous pharmacy the term *Mixture* is applied to every fluid compound intended for internal use, except a few which bear distinctive titles, such as Emulsions, Draughts, Enemas, Elixirs and Drinks. The simplest form of mixture in this extended sense is that in which two or more liquids are mixed together; but a great variety of substances may be prescribed in this form, chief among which are most of the soluble salts, light insoluble powders, salts which may be diffused by agitation, extracts, gum-resins, and the fixed essential oils. They are generally ordered in 2, 3, 4, 6, 8, 10 and 12-ounce vials.

Substances suitable to the mixture-form, properly so called, are those which, though more or less insoluble in water, will mix therewith by means of agitation, trituration, etc. Those most frequently ordered are as follows:—

Diffused by Agitation:—

- Calcii Phosphas Præcipitatus.
- Cinchona (powdered).
- Ipecacuanha (powdered).
- Magnesia.
- Quininæ Sulphas.
- Sulphur Præcipitatum.

Suspended by Viscid Excipients:—

- Essential Oils.
- Oleum Amygdalæ.
- Oleum Morrhuæ.
- Oleum Olivæ.
- Oleum Ricini.
- Copaiba.
- Ferri Carbonas Saccharatus.

Miscible only by Trituration:—

- Ammoniacum.
- Asafœtida.
- Confectio Rosæ.
- Confectio Sennæ.
- Extractum Aconiti.
- Ext. Belladonnæ Fol. Alcohol.
- Ext. Conii.
- Ext. Hyoscyami.
- Ext. Stramonii.
- Ext. Glycyrrhizæ.
- Ext. Krameriæ.
- Ext. Taraxaci.
- Guaiacum.
- Scammonium.
- Myrrha.

Best Suspended by the aid of a Fixed Oil or Yolk of Egg:—

- Ext. Cannabis Indicæ.
- Camphora.
- Oleum Terebinthinæ.
- Chloroformum.

Solutions intended for internal administration are classed as Mixtures in extemporaneous pharmacy, for the reasons already stated. The following list of acids and salts comprises most of the solids which are best adapted for use in liquid form, by reason of their solubility in water.

- Acidum Citricum.
- Acidum Tannicum.
- Acidum Tartaricum.
- Alumen.
- Ammonii Chloridum.
- Antim. et Potass. Tartras.
- Barii Chloridum.
- Calcii Chloridum.
- Calcii Hypophosphis.
- Ferri Pyrophosphas.
- Ferri Sulphas.
- Ferri et Ammonii Citras.
- Ferri et Potassii Tartras.
- Ferri et Quininæ Citras.
- Magnesii Sulphas.
- Mangani Sulphas.
- Potassii Acetas.
- Potassii Bicarbonas.
- Potassii Bromidum.
- Potassii Carbonas.
- Potassii Citras.
- Potassii Chloras.
- Potassii Hypophosphis.
- Potassii Iodidum.
- Potassii Tartras.
- Potassii et Sodii Tartras.
- Morphinæ Acetas.
- Morphinæ Hydrochloras.
- Morphinæ Sulphas.
- Sodii Bicarbonas.
- Sodii Boras.
- Sodii Carbonas.
- Sodii Chloridum.
- Sodii Hypophosphis.
- Sodii Phosphas.
- Sodii Sulphas.

A few require the use of viscid substances as vehicles or correctives. They are as follows:—

- Ammonii Carbonas.
- Plumbi Acetas.
- Potassa.
- Potassii Cyanidum.
- Hydrargyri Chloridum Corrosivum.

Certain salts are best ordered by prescribing such agents as will when in solution together react upon each other and produce the desired salt. Instances of this may be found in the pharmacopœial processes for most of the official Liquores, some salts so produced being the following:—

- Ammonii Acetas.
- Magnesii Citras.
- Potassii Citras.
- Ferri Citras.
- Ferri Acetas.
- Ferri Chloridum.
- Ferri Nitras.
- Hydrargyri Nitras.
- Potassii Arsenis.
- Potassii Hydras.
- Sodii Hydras.
- Zinci Chloridum.

Certain other substances require the addition of other agents in order to form eligible solutions. Such are the following:—

Quininæ Sulphas,—requires acidulated water for its solution, the acid used being generally Diluted Sulphuric, or the Aromatic Sulphuric. This method of prescribing the salt develops its bitter taste to the utmost, and is often avoided by ordering the drug to be suspended in a viscid liquid, such as Pulv. Acaciæ in Syrup of Ginger. In such a case an officious dispenser anxious to show his smartness by adding some dilute Sulphuric Acid to dissolve the Quinine would thereby defeat the object of the prescriber.

Quinine Sulphate may be prescribed with Aromatic Spirit of Ammonia, Spirit of Nitrous Ether, Tinctures or other alcoholic preparations together with Glycerin or Syrup and Water. In such cases the salt should be first dissolved in the alcoholic portion of the prescription, then the glycerin or syrup and finally the aqueous portions should be added gradually. It may also be ordered with Diluted Sulphuric Acid and some vegetable infusion containing Tannin, in which case a precipitate of Quinine Tannate will be produced. This of course should not be filtered, but should be dispensed with a "Shake-label."

For the use of *Velatine* as a vehicle for the administration of Quinine Salts, see under the title CINCHONA, in Part I.

Chinoidin, Cinchonine Sulphate and **Quinidine Sulphate,**—also require the addition of a dilute mineral acid for their solution in aqueous mixtures.

Iodine,—requires the addition of Potassium Iodide for its solution in a convenient quantity of water, as in the case of the official Liquor Iodi Compositus.

Hydrargyri Iodidum Rubrum, *Red Mercuric Iodide,*—requires the addition of Potassium Iodide or Mercuric Chloride for its aqueous solution.

Potassii Bitartras, *Cream of Tartar,*—requires the addition of Borax or Boric Acid for its solution in water.

Benzoic Acid,—requires the addition of Borax to aid its solubility in water, an equal part of the latter making it 5 times more soluble than when alone.

Lime,—is more soluble in sweetened water than in plain water, the sugar aiding its solution.

Excipients are substances which give form and consistence to prescriptions, and serve as vehicles for the exhibition of the other ingredients. Some of the excipients are *Diluents*, or agents which effect the dilution or division of the active ingredients; while others act in the double capacity of diluents and *Flavoring agents*. The Excipients most generally used in mixtures may be tabulated as follows,—

Diluents.	*True Excipients.*
Water (Aqua).	Acacia (in powder or mucilage).
Medicated Waters (Aquæ).	Tragacanth (in powder or mucilage).
Syrups.	Confections. Sugars.
Mel Rosæ.	Some Extracts.
Elixir Aromaticum.	Yolk of Egg (Vitellus).

Flavoring Agents.

Oleum Amygd. Amaræ.
Oleum Cari.
Oleum Caryophylli.
Oleum Cinnamomi.
Oleum Gaultheriæ.
Oleum Sassafras.
Tinct. Aurantii Dulcis.
Tinct. Cardamomi.
Tinct. Cardamomi Comp.
Tinct. Cinnamomi.
Tinct. Gentianæ Comp.
Tinct. Tolutana.
Tinct. Vanillæ.
Tinct. Zingiberis.
Spiritus Anisi.
Spiritus Lavandulæ.
Spiritus Limonis.
Spiritus Myristicæ.
Spiritus Menthæ Piperitæ.
Spiritus Menthæ Viridis.
Syrupus Limonis.
Syrupus Tolutanus.
Syrupus Zingiberis.

Compounding the Mixture is a matter of no slight importance, and one which is best learned at the dispensing counter, though a few directions may not be out of place. In the case of the simplest form of mixture, where two or more fluid preparations are prescribed together, the only operations required are the measuring of the several ingredients and pouring them into the designed vial. In doing this the compounder should pursue a regular and definite order of procedure. Taking in his left hand a graduate of sufficient capacity to hold the whole quantity prescribed, he should walk alongside the shelves, and with the right hand pour from the stock-bottles the requisite quantity of each ingredient in the order in which they are entered on the prescription. A skillful druggist will hold the graduate between the thumb and first finger, the prescription between the second and third fingers, and the stopper of the stock-bottle between the little finger and the hand, leaving his right hand free for the manipulation of the bottles containing the ingredients.

When an actively poisonous agent is ordered it should always be the last thing put into the mixture. Attention to this rule will prevent the danger of the toxic substance being put in twice.

The order in which the ingredients are put together is not of so much importance in compounding a simple mixture as in the case of an emulsion, and the order of the prescription can usually be followed, with the exception noted in the preceding paragraph. Still, when several alcoholic preparations, syrups and waters are ordered together, it is good practice first to mix the alcoholic fluids, then to add the syrups and finally the water, so as to avoid the precipitation of resinous principles which would occur if the alcoholic solutions were added to the water. Distilled water should always be used, in order to insure uniformity in taste and appearance, and also as a matter of purity and cleanliness. All mixtures should be well shaken before being labelled.

Solids which are comparatively insoluble or only slowly soluble require to be rubbed up in a mortar with one or more of the fluid ingredients. Glass mortars are much employed for this purpose, and many compounders mix all the ingredients in such a mortar before transferring them to the vial. Vegetable powders (as Rhubarb, Ipecac, etc.), or finely pulverized inorganic substances, are often ordered in intimate mixture with water, thickened with mucilage or syrup. In such cases the mixture should be made in a porcelain or wedgewood mortar, enough mucilage or syrup being added at first to make a thick paste, and after this is rubbed smooth the water may be gradually added during the continued process of mixing. This process will answer for all inorganic substances in powder, except Magnesia, which is best mixed by being thrown on the surface of the water; after it has sunk to the bottom as a uniform sediment the other ingredients may be added and the whole well shaken.

Froth upon the surface of the liquid, which often arises after agitation and may prevent the corking of the bottle, will quickly subside on the addition of a few drops of alcohol.

The following are specimens of prescriptions for medicines to be administered in mixture form:—

Bismuth Mixture for Children.

℞. Bismuthi Subcarbonatis, . . ʒ ij.
Syrupi Acaciæ,
Aquæ Cinnamomi, ... aā ℥ ij.
Misce. Signa.—A teaspoonful every hour in choleraic diarrhea.

Quinine Mixture for Children.

℞. Quininæ Sulphatis (pulv.), . ʒ ss.
Acaciæ (pulv.), ... ʒ ss.
Syrupi Zingiberis, ... ℥ iv.
Fiat mistura. Signa.—A teaspoonful thrice daily.

Mucilagines, *Mucilages,*—are thick, viscid liquids prepared by dissolving gum in water, or by extracting with water the mucilaginous principles from certain plants. They are easily spoiled and should be kept only in small quantities. The official Mucilages number 4, as follows, the first two being prepared without heat, the last two with heat,—

Mucilago Acaciæ.
Mucilago Sassafras Medullæ.
Mucilago Tragacanthæ.
Mucilago Ulmi.

Oleata, *Oleates,*—are liquid solutions of metallic salts or alkaloids in Oleic Acid, intended for external administration. They are not definite chemical compounds, though the term is also employed in trade to designate certain solid preparations which are claimed to be chemical compounds of the same acid with various bases. [See under ACIDUM OLEICUM, *ante*, page 103.] There are three official Oleates, as follows,—

Oleatum Hydrargyri (20 per cent.).
Oleatum Veratrinæ (2 per cent.).
Oleatum Zinci (5 per cent.).

Oleoresinæ, *Oleoresins,*—are liquid preparations consisting principally of natural oils and resins extracted from vegetable substances by percolation with Ether. They differ from fluid extracts in not bearing any uniform relation of cc. to the gramme of drug, in containing principles which though soluble in ether are not so in alcohol, and in some instances being devoid of principles which are insoluble in ether but soluble in alcohol. They are the most concentrated liquid preparations of drugs which can be produced, and are prepared by percolating the powdered drug with Ether until exhausted, recovering the greater part of the ether by distillation, and exposing the residue in a capsule to spontaneous evaporation until the remaining ether has evaporated. There are 6 official Oleoresins, viz.—

Oleoresina Aspidii (10–15).
Oleoresina Capsici (5).
Oleoresina Cubebæ (18–25).
Oleoresina Lupulini (50).
Oleoresina Piperis (5).
Oleoresina Zingiberis (6–8).

The figures in parentheses show the percentage of oleoresin yielded by each drug.—

ta, *Paints*, (Unofficial),—are preparations for external use,
not be classed with the preceding. They are generally pre-
kin diseases, for use over inflamed joints, or for application to
vith a camel's-hair brush.

odi, ... ℥j.
, ... ℥iij.
coniti, ... ʒss.
lladon. Rad. Fl., . ʒiv.
æ Sulph., ... gr. ij.
. . . . ʒjss.
4 or 5 coats freely over the
painful parts.

℞. Alcoholis, Saponis Viridis,
Olei Cadini, . . . aa ℥j.
Sig.—Paint over the part.

℞. Olei Tiglii, ... ʒj.
Ætheris, ... ℥ij.
Tinct. Iodi, ... ʒv.
M. Sig.—Paint on once in 3 days.

Pills,—are spherical masses composed of medicinal agents
ed to be swallowed whole. The *Mass* consists of the active
and the *Excipient*, the latter being the substance which gives
its adhesive and plastic qualities. In official pharmacy the
re specified both as to composition and quantity in each case,
directed to be used in the preparation of the 3 official Masses
official Pills are as follows,—

with *Soap and Water*,—Pil. Aloes, Pil. Aloes et Asafœtidæ, Pil. Asafœ-
l. Opii, Pil. Rhei.
with *Water* alone,—Pil. Aloes et Mastiches, Pil. Catharticæ Comp., Pil.
cæ Vegetabiles, Pil. Rhei Comp.
up,—Pil. Aloes et Myrrhæ.
cilage of Tragacanth,—Pil. Antimonii Comp.
cia and Water,—Pil. Ferri Iodidi.
cerin and Water,—Pilulæ Phosphori, Pil. Ferri Carbonatis.
fection of Rose,—Pilulæ Aloes et Ferri.
ney, Syrup and Water,—Massa Ferri Carbonatis.
cerin and Honey of Rose,—Massa Hydrargyri.
xcipient,—Massa Copaibæ, being a resin left after distillation.

rmacopœial directions for the formation of the pill-mass vary
e, but in general they prescribe that the ingredients shall be
nately, then beaten with the excipient to form a mass and
o a certain number of pills. Two of the official pills are
be coated with an ethereal solution of the Balsam of Tolu,
erri Iodidi and Pilulæ Phosphori. Full descriptions of the
ils of pill-making are given on the next page.

ber of official pills is 15, for the composition of which the
eferred to their several titles in the section on Materia Medica.
amed as follows,—

Aloes.
Aloes et Asafœtidæ.
Aloes et Ferri.
Aloes et Mastiches.
Aloes et Myrrhæ.
Antimonii Compositæ.
Asafœtidæ.
Pilulæ Catharticæ Compositæ.
Pilulæ Catharticæ Vegetabiles.
Pilulæ Ferri Carbonatis.
Pilulæ Ferri Iodidi.
Pilulæ Opii.
Pilulæ Phosphori.
Pilulæ Rhei.
Pilulæ Rhei Compositæ.

Pills constitute a form of medicine very much used in extemporaneous pharmacy, and one with the preparation of which the compounder should be perfectly familiar, for it will constitute fully one-third of his work at the dispensing counter. Pills should not exceed 5 grains in weight, unless the ingredients are very heavy, as Bismuth, Calomel, Hydrargyrum cum Creta, etc., of which 6, 8, or 10 grains may be made into a pill which may be readily swallowed. A ***Bolus*** is a similar mass, but larger than a pill, while the names ***Granule*** and ***Parvule*** are given to masses smaller than the average pill.

THE PROCESS OF PILL-MAKING.

The Process of Pill-making is briefly as follows: The ingredients ordered in the prescription are separately weighed out in the order of their bulk, commencing with that one of which the smallest quantity is to be used. If any require pulverization they should be placed first in the mortar and reduced to powder, the other dry ingredients added, next the soft extracts and the excipient selected; the whole being worked up into a mass, the ***Pill-mass***, by the aid of the mortar and pestle. The perfect pill-mass should be uniform throughout, should not show any particles of any one ingredient, should have such a consistence that the pills made from it will retain their shape, should not be too hard, nor too dry, nor should it stick to the fingers. The mortar should be large and shallow, of unpolished wedgewood ware; having a thick, smooth and well-formed bottom and a pestle which fits it. The operation of working up the mass is one of kneading it between the end of the pestle and the side of the mortar, and if proper ingredients and excipient are used and the work is well done, the mass will eventually loosen itself from both mortar and pestle. If it does not do so it should be removed with a spatula when sufficiently worked, and may be kneaded for a few minutes between the fingers. It should then be placed upon the tile or slab previously dusted with a little Lycopodium or Starch in fine powder, and rolled into a long cylinder by the aid of a broad-bladed spatula, until the mass is of a length corresponding to the divisions on the tile-scale which represent the number of pills to be made. The mass should then be placed along the scale, and a cut made through it with the spatula at each division, the pieces being at once rounded separately into pills by the thumb and two fingers of each hand. A pill-machine is often employed, consisting of two metal plates having semi-cylindrical grooves on one side, set into wooden boards, the whole forming a convenient apparatus for rolling the mass and then cutting it into the required number of pills by one movement. The pills are then left to dry upon the slab while the label is being written, after which they are placed in a pill-box, or in a wide-mouthed bottle if they contain volatile ingredients, and surrounde by a *Conspergative* powder (Lycopodium, powdered Chalk, dusted Talc), to prevent their adhering together or losing their shape.

Excipients used in pill-making are seldom mentioned in the prescription, but are usually left to the choice of the compounder. Some substances need no excipient, but may be made at once into pills; such being the softer Extracts and some Gum-resins, the former if too hard only needing a little water, and the latter a few drops of spirit to soften them to the required degree of plasticity. Every druggist has his favorite pill-excipient, many using a paste made of powdered Tragacanth 1, Glycerin 3½ and Water 1 part, while others use Extract of Malt or a mixture of Syrup and powdered Acacia for general use. Powdered Tragacanth to give tenacity, Glycerin to keep the mass soft, and Water to develop the adhesive qualities of many ingredients, will answer for fully nine-tenths of all the cases which occur in practice. These three excipients should stand on the dispensing counter ready for use, and all ready-made pastes or mixtures should be discarded as being slovenly, dirty and liable to change. The excipients described below are those in general use and are arranged in the order of their comparative importance.

LIQUID EXCIPIENTS.

Glycerin,—is a very valuable excipient, as it continually attracts moisture from the atmosphere, and pills made from it do not get hard. It should always be used for Quinine pills. *Glycerites of Starch* or *Tragacanth* are generally useful excipients. The former is official, the latter is made in the proportion of ʒss to the ℥.

Glucose,—is a good excipient, being colorless, adhesive, and not readily volatilized at ordinary temperatures. Since its introduction by Mr. Lascheid for this purpose it has steadily grown in favor.

Honey,—may be used for dark-colored substances. It should be evaporated to one-half its bulk, and then if mixed with a little Tragacanth it makes an excellent excipient for insoluble powders.

Extract of Malt,—is a pretty fair excipient, but has the disadvantage of its dark color.

Syrup,—is a fair excipient for powders, but it should not be used for metallic salts, especially Calomel, which it reduces in a short time. *Syrup of Acacia* is good where there is little room left for the excipient, but pills made with it become very hard and insoluble if they are kept long.

Mucilage of Acacia,—is very adhesive, but not a good excipient for the same reason as given for the syrup.

Water,—is only used alone as an excipient when the ingredients possess sufficient adhesiveness to be developed by the water. Such are the following powders: Aloes, Rhubarb, Kino, Tannic Acid, Opium, Squill, Asafœtida,—also Ferric Citrate, Berberine Sulphate, and some other salts.

Alcohol,—is used to soften Camphor, Compound Extract of Colocynth, Guaiac, resinous extracts, gums, etc.

SOLID EXCIPIENTS.

Tragacanth,—is an excellent excipient, especially for substances which are too soft, giving them body and elasticity.

Acacia,—is added to give more adhesiveness than can be obtained from viscid liquids alone. Pills made with it are generally very hard. It is used for Silver Nitrate, which may explode if mixed with vegetable extracts or glucose.

Soap,—is the best for resinous and fatty substances, increasing the solubility of the former. It is oftener employed in the official pills than any other excipient, but should not be used for substances which are decomposed by an alkali, nor for Tartar Emetic.

Bread-crumb (*Mica Panis*),—is an excellent excipient for Croton Oil, or other powerful liquid substances, as volatile oils.

Confection of Rose,—is too bulky for general use, but is a good excipient for very active agents like Strychnine, which are used in small quantity.

Althæa,—is good for absorbing and adhesive purposes, but is too bulky for general use.

Petrolatum, Cacao Butter, and **Resin Cerate,**—are used for oxidizable substances, as Potassium Permanganate.

Kaolin,—is well adapted as an excipient for Silver Nitrate and other substances which are easily decomposed.

Liquorice,—is an old excipient, but not much employed now. In powder it may be used for oils.

Conspergatives are absorbent powders which are dusted upon the finished pills and put around them in the box or vial in which they are dispensed, to keep them from sticking together and losing their shape. Powdered Liquorice was formerly much used for this purpose, but the best conspergatives are Lycopodium, Talc, Althæa and Rice Flour, the latter especially for white pills.

Substances suitable for the pilular form of medicine are—

Those acting in small doses. Heavy, insoluble substances.
Those intended to act slowly. Fetid substances.
Those to act on the lower bowel. Vegetable extracts.
Gums-resins, Balsams, Turpentine.

When the basis is an unadhesive substance, one of the other ingredients should be an extract or a vegetable powder which will form a mass by moisture alone. Attention to this rule in prescribing pills will often prevent the increase of their size by the use of inert excipients.

Substances difficult to combine, except by peculiar treatment, are met with frequently. The following notes will cover most such cases:—

Aloes,—is best treated on a heated slab with alcohol in very small quantity. Soap is the excipient in the official Pilulæ Aloes.

Butyl Chloral Hydrate,—should be treated with a little Confection of Rose and thick mucilage.

Calcium Sulphide,—should be well triturated with an equal quantity of Sugar of Milk, and then worked up with a little powdered Liquorice-root and Tragacanth Mucilage.

Camphor,—should be powdered with a little alcohol, and may be worked into a pill-mass with Glycerite of Tragacanth after the evaporation of the alcohol.

Carbolic Acid,—requires nearly an equal part of wheaten flour or bread-crumb, with a very minute quantity of Glycerite of Tragacanth. **Creosote** may be made into a mass by the addition of Powdered Liquorice with a very little bees' wax. If made into a pill with Silver Oxide it will explode unless the silver salt be first diluted by trituration with Liquorice, Gentian, or some other inert powder.

Iron and Quinine Citrate,—is very deliquescent with most excipients. Canada Balsam is the best for it.

Copaiba,—may be made into a pill-mass by the addition of a little Magnesium Carbonate or Wax.

Croton Oil,—is best worked up with bread-crumb, though powdered Liquorice and mucilage of Acacia may be used.

Ferrous Iodide,—in pill form requires special manipulation and protection to remain unoxidized. The official Pil. Ferri Iodidi is prepared with Iodine and Reduced Iron, has Liquorice, Sugar, and Acacia as excipients, and is protected by a coating of Balsam of Tolu. In other formulæ, Acacia, Althæa, Cacao-butter, Elm bark, and Liquorice are used as excipients.

Ferrous Sulphate,—is used in Blaud's Pill and in the official Pil. Ferri Compositæ, with Potassium Carbonate, to form by mutual decomposition Ferrous Carbonate, which quickly passes into the ferric salt by exposure. Myrrh in powder and syrup is the excipient used for the official pill.

Gallic Acid,—makes a good pill with a very small quantity of Glycerin. **Tannic Acid** requires about one-fifth its weight of Glycerin and one-tenth of Mucilage.

Phosphorus,—presents the problem of combining it in pill without letting it oxidize. This is believed to be accomplished by the pharmacopœial directions for the Pil. Phosphori, according to which the Phosphorus is dissolved in Chloroform in a test-tube, then quickly worked into a mass with Althæa, Acacia, Glycerin and Water, and finally the pills are coated by shaking with an Ethereal solution of Balsam of Tolu. Carbon Disulphide is a better solvent, but when it is used the pill-mass retains its disgusting odor.

Potassium Acetate,—requires Canada Balsam to secure its stability in pill form. **Potassium Iodide** is best manipulated by rubbing it into a smooth paste with a very little water, then adding a small quantity of Liquorice powder. **Potassium Permanganate** should be worked up with Kaolin and a very little water. Resin Cerate, Soft and Hard Paraffin and Cacao-butter are also used as excipients.

Quinine,—requires very clean hands and tools, and a colorless excipient, as Glycerin or Glucose, to make a nice-looking pill. If one part of Tartaric Acid is added to four of the Quinine salt, the mass will be less likely to crumble and will be of less bulk. Quinine Sulphate may be made into small and soluble pills by simply triturating it with Aromatic Sulphuric Acid ♏iij to each 5 grains of the salt. The moulding into pills should be done at the moment when the mass has begun to dry. A drop of syrup or honey, added at this time, will prevent the too rapid hardening of the mass.

Rhubarb,—in powder makes a good mass with one-fifth of its weight of Glycerin; but Soap is the excipient ordered for the official Pilulæ Rhei.

Substances unsuited to the pilular form are—

Those requiring large doses, and those which are volatile.
Emetics, and other agents administered for immediate effect.
Essential Oils in quantity exceeding half a drop to each pill.
Oils and other bodies which require much solid matter to make a mass; except those prescribed in very small dose, as Croton Oil.
Deliquescent Salts, unless intended to be used immediately.
Efflorescent Salts, unless deprived of their water of crystallization.

Deliquescent Salts.

Ammonii Iodidum.
——— Nitras.
——— Valerianas.
Auri Chloridum.
Calcii Chloridum.
Chinolin Salts, except the Tartrate, which is stable.
Lithii Citras.
——— Bromidum.
——— Salicylas.

Efflorescent Salts.

Alumen (slightly).
Ammonii Carbonas.
——— Phosphas.
Antim. et Potassii Tartras (slightly).
Cupri Acetas.
——— Sulphas.
Magnesii Sulphas (slightly).
Potassii et Sodii Tartras (slightly).
——— Ferrocyanidum (slightly).
Quininæ Bisulphas.

Deliquescent Salts.

Magnesii Citras.
Potassa.
——— cum Calce.
Potassii Acetas.
——— Carbonas.
——— Citras.
——— Cyanidum.
——— Hypophosphis.
——— Sulphis.
——— Tartras.
Sodii Hypophosphis.
——— Iodidum.
Zinci Bromidum.
——— Chloridum.
——— Iodidum.

Efflorescent Salts.

Quininæ Sulphas (after a time).
Soda.
Sodii Acetas.
——— Arsenas (slightly).
——— Benzoas.
——— Boras (slightly).
——— Carbonas.
——— Hyposulphis.
——— Phosphas.
——— Santoninas (slightly).
——— Sulphas.
——— Sulphis.
Strychninæ Sulphas.
Zinci Acetas.
——— Sulphas.

Coated Pills are manufactured upon a large scale by the great drug houses, extensive machinery being employed for the purpose. The coating material used is either Sugar or Gelatin. The U. S. Pharmacopœia directs that two of the official pills shall be coated by being shaken with a solution of Balsam of Tolu in Ether,—Pil. Ferri Iodidi and Pil. Phosphori. In extemporaneous pharmacy it is rarely practicable to coat pills with anything except gold or silver leaf, and this is sometimes directed by the prescriber, the word "*Deaurentur*—let them be gilded" being used in the subscription. To do this neatly the pills should have no trace of powder on them, but should be first coated with a trifle of fresh mucilage by rolling between the mucilage-moistened fingers, each pill being then dropped directly on to a sheet of gold or silver leaf, until a dozen or more are so deposited. The leaf and its pills are then allowed to slide into a globular boxwood shaker, or the leaf may be first placed in the shaker and the pills dropped on it there. A cautious circular movement being given to the shaker the pills are caused to travel around its walls, and when the cover is removed they will be found to have each received an even coating of the metal used. Gold leaf should always be employed for pills of Blue Mass or Asafœtida, as silver is amalgamated with the former and turned black by the latter.

Albumin may be used for coating small numbers of pills, which should be of very firm consistence before the coating is applied. Each pill is rolled between two fingers with a little white of egg, and then revolved in a warm pan. Another method of finishing them is, after coating with albumin, to rotate them in a tray with powdered French chalk until their surfaces become smooth and shiny. This process gives a very nice finish.

The following prescriptions represent the composition of a few unofficial pills in general use. A complete pill formulary is easily obtained, being published annually by the principal manufacturers.

Anaphrodisiac and Sedative.

℞. Camphoræ, ... gr. xxx.
Lupulini, ... gr. xx.
Fiat massa et div. in pil. xx.
Sig.—One thrice daily.

Astringent Pill.

℞. Argenti Nitratis, . . . gr. xx.
Pulv. Cretæ (Gallicæ), . gr. lxxx.
Petrolati, q. s.
Fiat massa et div. in pil. xl.

Pills of Iron.

℞. Ferri Reducti, ... gr. l.
Mannæ, ... gr. xv.
Glucosi, q. s.
Fiat massa et div. in pil. xxv.
Sig.—One after each meal.

Emmenagogue Pill (*Otto*).

℞. Ferri Sulph. Exsic., . . gr. xlviij.
Pulv. Aloes, ... gr. xij.
Terebinthinæ, ... gr. xxvij.
Ol. Terebinth., ... ♏x.
Fiat massa et div. in pil. xxx.
Sig.—Two, three times a day.

Hooper's Female Pills.

℞. Pulv. Aloes Socot., . . . gr. xlviij.
Ferri Sulph. Exsic., . . gr. xxiv.
Ext. Hellebori Nig.,
Pulv. Myrrhæ,
Saponis, ... āā gr. xij.
Pulv. Canellæ Alb.,
Pulv. Zingiberis, . āā gr. vj.
Aquæ vel Syrupi, q. s.
Fiat massa et div. in pil., quisque pondo gr. ijss.
Sig.—One to three at a dose.

Astringent Pill.

℞. Plumbi Acetatis, ... gr. xvj.
Pulv. Camphoræ, . . . gr. xij.
Pulv. Opii, ... gr. iij.
Bismuthi Subcarb., . . . gr. xij.
Ext. Gentianæ, q. s.
Fiat massa et div. in pil. xij.
Sig.—One thrice daily.

Cholagogue Pills (*Squibb*).

℞. Resinæ Podophylli, . . . gr. vj.
Ext. Belladon. Alcohol., gr. iij.
Pulv. Capsici,
Pulv. Sacch. Lactis, . āā gr. xxiv.
Pulv. Acaciæ, ... gr. vj.
Glycerini, Syrupi, āā q. s.
Fiat massa et div. in pil. xxiv.
Sig.—One or two as required.

Aperient Pills.

℞. Pul. Aloes Socot., . . . gr. xxiv.
Pulv. Rhei, ... gr. xlviij.
Hydrarg. Chlor. Mitis., . gr. iv.
Antim. et Potas. Tart., . gr. ij.
Fiat massa et div. in pil. xxiv.
Sig.—One or two as needed.

Tonic Pill for Women.

℞. Strychninæ Sulph.,
Acidi Arsenosi, . . . āā gr. j.
Ext. Belladonnæ, . . . gr. v.
Quininæ Sulph., ... gr. xxxv.
Massæ Ferri Carb., . . gr. xc.
Fiat massa et div. in pil. xxxv.
Sig.—One three times daily.

Anti-Bilious Pills.

℞. Pulv. Scammonii,
Pulv. Aloes Socot.,
Pulv. Gambogiæ,
Hydrarg. Chlor. Mitis,
Potassii Bitart., . . . āā gr. xx.
Ext. Taraxaci, q. s.
Fiat massa et div. in pil. xx.

Potus, *A Drink* (Unofficial),—is a solution or a mixture intended to be used *ad libitum*, and generally consists of a Potassium or Sodium salt or a mineral acid, in dilute solution, sweetened and flavored.

The Imperial Drink. ℞. Potassii Bitartratis, ʒij; Olei Limonis, ♏v; Aquæ Bullientis, q. s. ad ℥xx. M. Fiat potus. Sig.—Use as a drink.

Pulveres, *Powders*,—are usually prepared extemporaneously, but a few compound ones have been made official, the ingredients being directed to be rubbed together until reduced to a fine powder and thoroughly mixed. Special directions are given for the preparation of two —the Compound Effervescing Powder and the Compound Powder of Morphine. There are 9 official powders, named as follows,—

Pulvis Antimonialis.
Pulvis Aromaticus.
Pulvis Cretæ Compositus.
Pulvis Effervescens Compositus.
Pulvis Glycyrrhizæ Compositus.
Pulvis Ipecacuanhæ et Opii.
Pulvis Jalapæ Compositus.
Pulvis Morphinæ Compositus.
Pulvis Rhei Compositus.

The composition of each of these preparations will be found in the section on Materia Medica and under the title from which its name is derived, except that of the Compound Effervescing Powder, which is placed under the title POTASSIUM. Pulvis Ipecacuanhæ et Opii is really a trituration, its ingredients being rubbed together with sugar of milk into a very fine powder.

As prepared extemporaneously Powders are generally compound and may be mixed on a slab with a spatula, but a much better method of mixing them is by trituration in a mortar. The latter should always be employed except in the case of substances which may explode if so treated, as Potassium Chlorate with oxidizable substances. (See *ante*, page 550.) The diluent best employed in powders is Sugar of Milk, on account of its hardness, its density and its comparative insolubility. A coloring agent, as Carmine in minute quantity, is a useful ingredient, enabling the eye to judge of the degree of mixing and subdivision obtained. Powders containing soluble salts, extracts, volatile oils, camphor, or any other hygroscopic or volatile substances, should be dispensed in waxed paper. For ordinary powders the plain white paper of the drug-stores will answer, but a better paper for small powders is a very thin one having a high surface finish, as the white glazed French demy. Powders are often ordered in Wafers (*Cachets*), to be swallowed without unfolding. The division of powders into the number of Papers (*Chartulæ*) ordered and folding them neatly, require a considerable amount of practice. A small machine is used, over which the ends of the papers are bent, in order to have them of the proper size for the box in which they are dispensed. If they are to be put into an envelope, less exactness of folding is required, and the mechanical contrivance may be dispensed with.

Substances suitable to administration in the form of powders are those which are insoluble, those which would be chemically incompatible in fluid form, and certain pulverizable extracts. Those which are unsuited to this form are such as have a very nauseous taste or odor, substances of which the dose is large, those which are deliquescent, efflorescent or very volatile, and those which liquefy on mixing. A list of deliquescent and efflorescent salts is found on page 589, while the following-named, though dry alone, become moist when triturated together, viz.—

Sodium Sulphate and Potassium Carbonate.
Zinc Sulphate and Lead Acetate.
Camphor and Chloral Hydrate.

Many substances cannot be powdered without the intervention of another body: thus Opium requires a hard substance like sugar of milk or potassium sulphate, Camphor requires a minute quantity of alcohol, Myrrh needs sugar or gum, etc. Substances, as the alkaloids and their salts, which are very active and are used in very small doses, require some inert substance to give them bulk enough for division and handling.

Sugar of Milk will be found the best agent for this purpose. Prescriptions may order the ingredients for a single powder, with directions to dispense a certain number of the same composition; or they may give the quantities for the whole number of powders ordered, with instructions to divide into a certain number. The dispenser should carefully scan the prescription in order to avoid the multiplication of quantities where division is intended. The official powders are named on p. 591, and the following formulæ will serve to illustrate those generally prescribed:—

Astringent Powder for Infants.

℞. Plumbi Acetatis, ... gr. ij.
Pulveris Opii, ... gr. ss.
Camphoræ, ... gr. j.
Sacchari Lactis, . . gr. iij.
Trit. et div. in chartulas xij.
Sig.—One every 2 or 3 hours in diarrhea of infants. For an adult the above represents one dose.

Gastric Sedative.

℞. Bismuthi Subnitratis, . . . ʒj.
Pulveris Rhei,
Pulveris Aromat., . . . āā ʒss.
M. et div. in chartulas vj.
Sig.—One before each meal.

Laxative Powder.

℞. Hydrarg. Chlor. Mitis, . gr. x.
Sacchari Lactis, . . . gr. xx.
M. et fiant pulv. x.
Sig.—One powder twice daily.

Bismuth and Soda.

℞. Bismuthi Subnitratis,
Sodii Bicarb., ... āā ʒij.
Pulv. Zingiberis, ... gr. xl.
M. et div. in chartulas xij.
Sig.—One after each meal.
Corrective in dyspepsia, acne and eczema.

Antipruritic Powder.

℞. Pulveris Camphoræ, ... ʒj.
Zinci Oxidi, ... ℥iv.
Pulv. Amyli, ... ʒj.
M. et fiat pulvis.
Sig.—Use locally as a dusting powder to relieve itching.

Catarrh Powder.

℞. Bismuthi Subnitratis, . . . ʒiij.
Pulv. Acaciæ, ... ʒj.
Pulv. Talci, ... ʒij.
Morphinæ Hydrochlor., . gr. j.
M. Sig.—Use by insufflation.

Compressed tablets are really powders which have been compressed into tablet shape by machinery. A little pressure from the blade of a spatula will restore them to the powder form.

Resinæ, *Resins.*—Pharmaceutical resins are solid preparations obtained by precipitating the resinous principles of plants from their alcoholic solution by the agency of water. They differ from alcoholic extracts in containing only those principles which are soluble in alcohol and insoluble in water, while the extracts contain all principles which are soluble in alcohol. Besides Resina itself, which is the residue left after distilling off the volatile oil from Turpentine, there are 4 official Resins, three of which correspond to the above description, and one (Resin of Copaiba) is the residue left after distilling off the volatile oil from Copaiba. They are named:—

Resina Copaibæ.
Resina Jalapæ.
Resina Podophylli.
Resina Scammonii.

True Resins are defined on page 25.

Spiritus, *Spirits*,—are alcoholic solutions of volatile substances, which may be solids, liquids or gases. They are officially prepared either by simple solution, by solution with maceration, by gaseous solution, by chemical reaction or by distillation. The menstruum is Alcohol or Deodorized Alcohol in nearly all instances, 4 having Water in addition, and 2 being alcoholic liquors of a specified alcoholic strength (Whiskey, Brandy). The official spirits are 25 in number, as follows,—

Spiritus Ætheris, 32½.
Spiritus Ætheris Compositus, 32½.
Spiritus Ætheris Nitrosi, 4.
Spiritus Ammoniæ, 10.
Spiritus Ammoniæ Aromaticus, 9.
Spiritus Amygdalæ Amaræ, 1.
Spiritus Anisi, 10.
Spiritus Aurantii, 5.
Spiritus Aurantii Compositus, 20.
Spiritus Camphoræ, 10.
Spiritus Chloroformi, 6.
Spiritus Cinnamomi, 10.
Spiritus Frumenti, 44–50.
Spiritus Gaultheriæ, 5.
Spiritus Glonoini. 1.
Spiritus Juniperi, 5.
Spiritus Juniperi Compositus, 63½.
Spiritus Lavandulæ, 5.
Spiritus Limonis, 5.
Spiritus Menthæ Piperitæ, 10.
Spiritus Menthæ Viridis, 10.
Spiritus Myrciæ, 55.
Spiritus Myristicæ, 5.
Spiritus Phosphori, 0.12.
Spiritus Vini Gallici, 39–47.

The figures placed after Spiritus Frumenti, Spiritus Juniperi Comp., Spiritus Myrciæ, and Spiritus Vini Gallici, represent the percentage of absolute Alcohol by weight in each; those placed after the others indicate the quantity of the principal ingredient in grammes to each 100 cubic centimeters of the preparation. Absolute Alcohol is the menstruum directed for Spiritus Phosphori.

Suppositoria, *Suppositories*,—are solid bodies containing medicinal substances, and intended for introduction into the vagina, rectum or urethra. The Pharmacopœia prescribes a general formula for their preparation, according to which the medicinal portion should be incorporated with Oil of Theobroma by rubbing together at a temperature of 95° F. The mixture should be poured into suitable moulds and cooled on ice or in ice-cold water. Unless otherwise specified they should have the following shapes and weights, corresponding to their several uses:—

Rectal Suppositories,—cone-shaped, about 1 gramme (15 grains) each.
Urethral Suppositories,—pencil-shaped, about 1 gramme (15 grains) each.
Vaginal Suppositories,—globular, about 3 grammes (45 grains) each.

The only official Suppositories are those of Glycerin, (*Suppositoria Glycerini*), in which Stearic Acid is employed to give the requisite consistence.

In extemporaneous pharmacy Suppositories are usually prepared with Cacao-butter as a basis, but for those intended for the uterus or urethra a mixture of Gelatin and Glycerin is considered the best excipient, being firmer and more plastic than cacao-butter, and more easily handled. Hollow cones of cacao-butter, or some composition resembling it, are kept in the shops, and will be used by the average druggist in filling prescriptions for rectal suppositories unless prohibited, as they save him conderable labor; the active drug being simply placed in the centre of the one, which is then sealed by a plug fitting into its base. These contrivnces are by no means so efficient as the regular suppository, in which he medicinal agent is thoroughly incorporated with the excipient, for the rmer smear the rectum with a quantity of melted grease before the active gredient is permitted to come into contact with its walls. The agents sed in suppositories are chiefly extracts and alkaloids, some few powders nd a few metallic salts are occasionally employed. Those for the adult ctum should contain about 15 grains of the excipient, for the vagina a rachm of cacao-butter is the average quantity. Those for the uterus and rethra are made of cylindrical instead of conical form, and about the iameter of a no. 9 catheter.

The methods of compounding suppositories are two—that by the use of oulds (the official method), and that by hand. The former process is escribed above, but many prefer the hand method which is as follows: he medicament is mixed with finely shaved Cacao-butter by the aid of a atula, on a board or tile lightly dusted with Lycopodium or Starch. fter a smooth and uniform mixture is thus obtained, the mass may be lled into cylindrical form, cut into the required sizes and with the atula given the required shape. When dispensed, they should be placed a powder-box between layers of cotton.

Bougies or *Pencils*, as urethral and uterine suppositories are often rmed, may be prepared by melting together White Gelatin 3, Glycerin and Distilled Water 1 part by weight, then adding the medicament d drawing the mass into a glass tube previously oiled inside. When ld the bougie may be pushed out and cut into suitable lengths.

Suppositories and bougies may be prescribed in the manner illustrated the following formulæ :—

Anodyne Suppository.

. Ext. Opii, ... gr. vj.
Ext. Belladonnæ Fol. Alcoholici, ... gr. ss.
Ext. Hyoscyami, ... gr. ij.
Olei Theobromæ, q. s.
M. Fiant suppositoria vj.
Sig.—One into the rectum morning and ght.

Anthelmintic.

. Santonini, ... gr. xij.
Olei Theobromæ, . ʒj.
M. Fiant suppositoria vj.
Sig.—One into the rectum as directed.

Quinine Suppository.

. Quininæ Sulphatis, . . gr. v.
Olei Theobromæ, . . . gr. x.
Fiat suppositorium unum, mitte tales sex.

Wade's Bougies.

℞. Iodoformi,
Bismuthi Subnitrat., . . āā ʒj.
Chloralis Hydratis, ... gr. viij.
Morphinæ Sulphat., . . . gr. iij.
Ol. Rosæ, ... ♏x.
Gelatini et Glycerini, q. s.
M. Fiant bougia xij.
Sig.—One into urethra thrice daily.

Bougie for Gleet.

℞. Zinci Sulphatis, ... gr. vj.
Ac. Carbolici, . . . ♏iij.
Pulv. Hydrastis, . . . gr. xij.
Ext. Belladonnæ Fol Alcoholici, ... gr. xij.
Gelatini et Glycerini, q. s.
M. Fiant bougia xij.
Sig.—One into the urethra night and morning.

In the British Pharmacopœia the following 7 suppositories are official, viz.—

Suppositoria Acidi Carbolici, *Phenol Suppositories,*—Phenol, 12 grains; White Beeswax, 24 grains; Oil of Theobroma, q. s. for 12 suppositories, each containing 1 grain of Phenol.

Suppositoria Acidi Tannici, *Tannic Acid Suppositories,*—Tannic Acid, 36 grains; Oil of Theobroma, q. s. for 12 suppositories, each containing 3 grains of Tannic Acid.

Suppositoria Belladonnæ, *Belladonna Suppositories,*—Alcoholic Extract of Belladonna, 18 grains; Oil of Theobroma, q. s. for 12 suppositories, each containing 1½ grains of the extract or approximately $\frac{1}{60}$ grain of the alkaloids of belladonna root.

Suppositoria Glycerini, *Glycerin Suppositories,*—Gelatin, cut small, ½; Glycerin, by weight, 2½; Distilled Water, a sufficiency to make as many suppositories as desired, according to size, each containing 70 per cent. by weight of Glycerin.

Suppositoria Iodoformi, *Iodoform Suppositories,*—Iodoform, 36 grains; Oil of Theobroma, q. s. for 12 suppositories, each containing 3 grains of Iodoform.

Suppositoria Morphinæ, *Morphine Suppositories,*—Morphine Hydrochloride, 3 grains; Oil of Theobroma, q. s. for 12 suppositories, each containing ¼ grain of the Morphine salt.

Suppositoria Plumbi Composita, *Compound Lead Suppositories,*—Acetate of Lead, 36 grains; Opium, in powder, 12 grains; Oil of Theobroma, q. s. for 12 suppositories, each containing 3 grains of Lead Acetate and 1 grain of Opium.

Syrupi, *Syrups,*—are concentrated solutions of Sugar in water or in aqueous liquids. They sometimes contain Acetic Acid, and occasionally Alcohol; and are termed ***simple, medicated*** or ***flavored,*** according as they are simple solutions of sugar in water alone, or contain soluble medicinal substances or flavoring ingredients. The sugar used should be very dry, and its official description corresponds with the granulated sugar of commerce. The permanency of these preparations chiefly depends on their possessing the proper relative proportions of sugar and water. They are prepared either by solution with heat, by agitation without heat, by adding a medicated liquid to simple syrup, by digestion or maceration, or by cold percolation; these processes being all officially directed except the last. They are best preserved by being poured while hot into pint bottles, which should be corked securely while full, and the tops dipped into melted sealing-wax. Fermented syrups are useless for dispensing purposes. The number of official syrups is 32, as follows,—

Syrupus.
Syrupus Acaciæ.
Syrupus Acidi Citrici.
Syrupus Acidi Hydriodici.
Syrupus Allii.
Syrupus Althææ.
Syrupus Amygdalæ.
Syrupus Aurantii.
Syrupus Aurantii Florum.
Syrupus Calcii Lactophosphatis.
Syrupus Calcis.
Syrupus Ferri Iodidi.
Syrupus Ferri, Quininæ et Strychninæ Phosphatum.
Syrupus Hypophosphitum.
Syrupus Hypophosphitum cum Ferro.
Syrupus Ipecacuanhæ.
Syrupus Krameriæ.
Syrupus Lactucarii.
Syrupus Picis Liquidæ.
Syrupus Pruni Virginianæ.
Syrupus Rhei.
Syrupus Rhei Aromaticus.
Syrupus Rosæ.
Syrupus Rubi.
Syrupus Rubi Idæi.
Syrupus Sarsaparillæ Compositus.
Syrupus Scillæ.
Syrupus Scillæ Compositus.
Syrupus Senegæ.
Syrupus Sennæ.
Syrupus Tolutanus.
Syrupus Zingiberis.

ellæ, *Tablets* (Unofficial),—are largely manufactured by several e firms, and consist of various medicinal powders pressed into tabpe by machinery. They are extremely convenient preparations physician's use, as quite a variety can be carried in a pocket-case, slight pressure is sufficient to reduce them to powder they can pensed with facility and accuracy of dosage. The following list es the most important of these preparations, the figures represent- number of grains in a tablet in each case:—

rsenous, $\frac{1}{60}$, $\frac{1}{40}$, $\frac{1}{30}$, $\frac{1}{20}$.
nzoic, 5.
llic, 5.
licylic, 2½, 5.
licylic, 2½, and Morphine, $\frac{1}{12}$.
nnic, 2, 5.
a, $\frac{1}{50}$.
. Aloes et Ferri (U. S. P.).
, et Myrrh, 1.
⅔, et Rhei, 1⅓, et Gentian, ⅔.
, ¼, ½.
ium Bromide, 5, 10.
ium Chloride, 3, 5, 10.
tic, Hydr. Chlor. Corros., 7½.
e, $\frac{1}{60}$.
Subcarb., 5.
bnitrate, 5, 10.
5.
Citrate, 1.
Sulphide, $\frac{1}{10}$, ¼, ½, 1.
, ¼, ½, 1, 2, 3, 5.
, 2, Opium, 1.
r Monobromated, 2, 3, 5.
nimalis, 10.
c, Compound (U. S. P.).
getable (U. S. P.).
Oxalate, 2.
ine Pastilles (Spencer).
a Alkaloids (Mixed).
ine Sulphate, 2, 3, 4, 5.
idine Sulphate, 2, 3, 4, 5.
Hydrochlorate, ⅙.
, ¼.
n, $\frac{1}{60}$.
of Cannabis Indica, ¼.
of Ignatia Amara, ¼, ½.
of Nux Vomica, ¼, ½.
's Test for grape-sugar in urine.
(Quevenne's), 1, 2.
senate, ⅛, ¼.
oto-carbonate, 3, 5.
ctate, 1.

Ferrum Pyrophosphate, 2.
—— and Quinine Citrate, 2, 3, 5.
Hydrargyrum, 1, 3, 5.
—— Chloridum Corros., $\frac{1}{60}$, $\frac{1}{40}$, $\frac{1}{20}$, $\frac{1}{10}$.
—— Iodidum Rub., $\frac{1}{32}$, $\frac{1}{16}$.
—— Iodidum Flavum, $\frac{1}{10}$, ⅛, ⅙, ¼.
—— Oxidum Flavum, $\frac{1}{200}$.
Ipecac. et Opii, 2, 3, 5.
Morphine Sulphate, $\frac{1}{10}$, ⅛, ⅙, ¼, ½.
Opium, Deodorized, 1.
Opium, ½, and Lead Acetate, 1½.
Pepsin, Saccharated, 2, 5.
Podophyllin, $\frac{1}{10}$, ⅛, ¼, ½, 1, 2.
Potassium Bromide, 5, 10.
—— Chlorate, 5.
—— —— and Borax, āā 2½.
—— Iodide, 5.
—— Nitrate, 5.
—— Permanganate, ½, 1, 2.
Quinine Bisulphate, ½, 1, 2, 3, 4, 5.
—— Salicylate, 2.
Quinine Sulphate, ½, 1, 2, 3, 4, 5.
Quinquinine, 2, 3.
Rhubarb, 3. Rhei Co. (U. S. P.).
Rhubarb, 2, and Magnesia, 2.
Salicin, 2½, 5.
Santonin, 1.
Santonin, 1, and Calomel, 1.
Sodium Bicarbonate, 5.
—— Salicylate, 3, 5.
Strychnine, $\frac{1}{100}$, $\frac{1}{60}$, up to $\frac{1}{20}$.
Zinc Phosphide, $\frac{1}{12}$ up to ½.

Hypodermic Tablets.

Morphine Sulphate, $\frac{1}{12}$ to $\frac{1}{2}$.
Morph. Sulph. and Atropine Sulph.
Atropine Sulphate, $\frac{1}{200}$–$\frac{1}{50}$.
Strychnine Sulphate, $\frac{1}{100}$.
Apomorphine Hydrochlorate, $\frac{1}{20}$–$\frac{1}{10}$.
Pilocarpine Hydrochlorate, $\frac{1}{20}$–$\frac{1}{2}$.
(And several others.)

terms *Tabloid* and *Soloid* are proprietary designations of compressed tablets tured by a particular firm, Messrs. Burroughs, Wellcome and Co., of London, l.

cturæ, *Tinctures*,—are alcoholic solutions of medicinal substances, th one official exception (Tincture of Iodine) are made from non-volatile bodies. They are prepared by percolation, maceration, solution or dilution; the menstrua employed being chiefly Alcohol, Diluted Alcohol, and Alcohol and Water in various proportions. In one case (Tincture of Sanguinaria) Acetic Acid is an ingredient of the menstruum, in two the Aromatic Spirit of Ammonia, and in several Glycerin.

For **Tinctures of Fresh Herbs** (*Tincturæ Herbarum Recentium*), the Pharmacopœia prescribes a general formula, according to which, when not otherwise directed, they are to be prepared by macerating 50 grammes of the fresh herb, bruised or crushed, in 100 cubic centimeters of alcohol, for 14 days, then expressing the liquid and filtering.

The official Tinctures number 71, and are named in the following list, the figures placed after each name giving the number of grammes of the drug in each 100 cubic centimeters of the tincture:—

Tinctura Aconiti, 35.
Tinctura Aloës, 10.
Tinctura Aloës et Myrrhæ, 10.
Tinctura Arnicæ Florum, 20.
Tinctura Arnicæ Radicis, 10.
Tinctura Asafœtidæ, 20.
Tinctura Aurantii Amari, 20.
Tinctura Aurantii Dulcis, 20.
Tinctura Belladonnæ Foliorum, 15.
Tinctura Benzoini, 20.
Tinctura Benzoini Composita, 12.
Tinctura Bryoniæ, 10.
Tinctura Calendulæ, 20.
Tinctura Calumbæ, 10.
Tinctura Cannabis Indicæ, 15.
Tinctura Cantharidis, 5.
Tinctura Capsici, 5.
Tinctura Cardamomi, 10.
Tinctura Cardamomi Composita, 2.
Tinctura Catechu Composita, 10.
Tinctura Chiratæ, 10.
Tinctura Cimicifugæ, 20.
Tinctura Cinchonæ, 20.
Tinctura Cinchonæ Composita, 10.
Tinctura Cinnamomi, 10.
Tinctura Colchici Seminis, 15.
Tinctura Croci 10.
Tinctura Cubebæ, 20.
Tinctura Digitalis, 15.
Tinctura Ferri Chloridi, 13.6.
Tinctura Gallæ, 20.
Tinctura Gelsemii, 15.
Tinctura Gentianæ Composita, 10.
Tinctura Guaiaci, 20.
Tinctura Guaiaci Ammoniata, 20.
Tinctura Humuli, 20.
Tinctura Hydrastis, 20.
Tinctura Hyoscyami, 15.
Tinctura Iodi, 7.
Tinctura Ipecacuanhæ et Opii, 10.
Tinctura Kino, 10.
Tinctura Krameriæ, 20.
Tinctura Lactucarii, 50.
Tinctura Lavandulæ Composita, 0.8.
Tinctura Lobeliæ, 20.
Tinctura Matico, 10.
Tinctura Moschi, 5.
Tinctura Myrrhæ, 20.
Tinctura Nucis Vomicæ, 20.
Tinctura Opii, 10.
Tinctura Opii Camphorata, 0.4.
Tinctura Opii Deodorati, 10.
Tinctura Physostigmatis, 15.
Tinctura Pyrethri, 20.
Tinctura Quassiæ, 10.
Tinctura Quillajæ, 20.
Tinctura Rhei, 10.
Tinctura Rhei Aromatica, 20.
Tinctura Rhei Dulcis, 10.
Tinctura Sanguinariæ, 15.
Tinctura Scillæ, 15.
Tinctura Serpentariæ, 10.
Tinctura Stramonii Seminis, 15.
Tinctura Strophanthi, 5.
Tinctura Sumbul, 10.
Tinctura Tolutana, 10.
Tinctura Valerianæ, 20.
Tinctura Valerianæ Ammoniata, 20.
Tinctura Vanillæ, 10.
Tinctura Veratri Viridis, 40.
Tinctura Zingiberis, 20.

Triturationes, *Triturations*,—form a class of powders having for their diluent Sugar of Milk, and possessing a definite relation between the active ingredient and the diluent. The Pharmacopœia prescribes a general formula for these preparations, according to which 10 grammes of the

ce and 90 of Sugar of Milk are to be well mixed by a spatula, the
ing added in successive quantities, and both triturated in a mortar
e substance is intimately mixed with the diluent and finely com-
d. There is but one official trituration (Trituratio Elaterini),
the Pulvis Ipecacuanhæ et Opii practically belongs to this class,
in respect to the proportions prescribed. Sugar of Milk is em-
as the diluent because of its hardness and its comparative insolu-
The first of these qualities secures the fine comminution of the
ingredient, whereby the action of the medicine is increased and
listributed. Its insolubility makes it the best diluent for powders
rations administered from a spoon or glass with fluid, as is so often
or unlike cane sugar it is not readily dissolved and does not leave
ive substance behind on the surface of the utensil. Triturations
ellent forms for the administration of powerful alkaloids, which
ns be divided with great accuracy into the minute quantities re-
Mercury and its salts are especially adapted to this method of
tion, being more uniformly divided and hence more active than
dministered in any other form. Triturations of mercury with sugar
mmonly used in England a hundred years ago, and triturations of
ubstances were employed by the Arabian physicians of the 13th
; but the subsequent adoption of these preparations by the home-
ts produced such a prejudice against them in the ranks of the regu-
fession, that until recently any one using them stood in danger
g stigmatized as a homeopath. Their recognition by the U. S.
copœia under their proper title does away with any such implica-
ough it is much to be regretted that the compilers of the last two
ns of the British Pharmacopœia should have shown their fear of a
y continuing the title Pulvis Elaterini Compositus to designate
ration which in every respect is a trituration. The preparations
in daily prescribed by physicians all over the country are really
f-milk triturations of that ferment, and not pure pepsin as many
. Professor H. G. Piffard, Med. Dept. Univ. of the City of New
n his treatise on the Materia Medica and Therapeutics of the Skin
1881), after detailing several microscopical examinations of pills
turations, uses the following language:—

> s to be expected, therefore, that the protoiodide trituration will prove, *ceteris*
> more active than the pill, and such we have found it. . . . Since we have
> triturations, however, in preference to the ordinary pills, patients more rarely
> of disagreeable sensations. We have been enabled to materially reduce the
> e dose in order to obtain the desired effect. In other words, a larger proportion
> ug is utilized for *specific* purposes, while but a small amount remains to give rise
> *rritation*. . . . . I have nothing to add to this, except that I continue to
> rations of Mercury and other substances with increasing satisfaction. Beside
> ntioned I employ Calomel, Cyanide of Mercury, Black Oxide of Mercury and
> Sublimate in this form."

The following examples will illustrate the mode in which Triturations may be prescribed:—

℞. Hydrarg. Oxidi Flavi, . gr. ss.
Sacchari Lactis, ... gr. l.
Trit. et div. in chartulas xxiv.
Sig.—One twice daily.

℞. Hydrarg. Chlor. Mitis, . gr. x.
Sacchari Lactis, q. s.
Trit. et div. in chartulas x.
Sig.—One powder daily.

℞. Morphinæ Sulph., . . . gr. j.
Sacchari Lactis, ... gr. xvj.
Trit. et div. in chartulas viij.
Sig.—One every six hours.

℞. Acidi Arsenosi, ... gr. ss.
Sacch. Lactis, ... gr. xl.
Trit. et div. in chartulas xx.
Sig.—One powder thrice daily.

Trochisci, *Troches,* also called *Pastilles* or *Lozenges,*—are small flattened cakes of medicinal substances, prepared from a mass made with a basis of Sugar, some having Mucilage of Tragacanth, others Orange-flower Water, Syrup of Tolu, etc., as excipients. They are especially useful when the active ingredients are intended to come into contact with the mucous surface of the throat. There are 15 official Troches, named as follows:—

Trochisci Acidi Tannici.
Trochisci Ammonii Chloridi.
Trochisci Catechu.
Trochisci Cretæ.
Trochisci Cubebæ.
Trochisci Ferri.
Trochisci Glycyrrhizæ et Opii.
Trochisci Ipecacuanhæ.
Trochisci Krameriæ.
Trochisci Menthæ Piperitæ.
Trochisci Morphinæ et Ipecacuanhæ.
Trochisci Potassii Chloratis.
Trochisci Santonini.
Trochisci Sodii Bicarbonatis.
Trochisci Zingiberis.

Troches are not readily compounded at the dispensing counter, but may be obtained in all first-class shops, being prepared in great variety by the manufacturers. Besides the official Troches, those named in the following list are generally for sale:—

Alum, gr. ij.
Alum, gr. 1½, Catechu, gr. ij.
Ammonium Chloride, gr. ij, and Cubeb, gr. j.
Ammon. Chlor., gr. ij, Liquorice, gr. viij.
Benzoic Acid, gr. ½.
Borax, gr. iij.
Bismuth, gr. ij, and Charcoal, gr. v.
Bronchial,—Oleores. Cubebæ, gr. $\frac{1}{5}$, Tolu, gr. $\frac{1}{5}$, Ol. Sassafras, gr. $\frac{1}{10}$, and Ext. of Liquorice, gr. vij.
Brown Mixture.
Carbolic Acid, gr. j.
Ginger and Sodium Bicarbonate.
Guaiac, gr. ij.
Kino, gr. ij.
Lettuce, gr. j.
Lime-juice.
Logwood, gr. ij.
Magnesia, gr. iij.
Pellitory, gr. j.
Pepsin, gr. iij, Charcoal, gr. iij, Magnesia, gr. ij, and Ginger, gr. j.
Potassium Bitartrate, gr. iij.
Potassium Citrate, gr. iij.
Santonin, gr. ½, and Calomel, gr. ½.

Unguenta, *Ointments,*—are soft, fatty mixtures of medicinal agents with a basis of lard, petrolatum, or fixed oils with a solid fat such as wax or spermaceti. They are intended for application to the skin by inunction, and have a melting point which is below the ordinary temperature of the human body. Of the 23 official Ointments 1 is prepared by chemical reaction (Unguentum Hydrargyri Nitratis), 3 by fusion and 17 by incorporation of the ingredients with each other, they being mixed together by trituration or through the agency of a spatula and a porcelain slab. *Unguentum* itself is prepared by fusing together 80 of Lard and 20 of yellow Wax, and is the basis of 3 other ointments, while 14 have Benzoinated Lard as their basis. The official Ointments are—

Unguentum.
Unguentum Acidi Carbolici (5).
Unguentum Acidi Tannici (20).
Unguentum Aquæ Rosæ.
Unguentum Belladonnæ (10).
Unguentum Chrysarobini (5).
Unguentum Diachylon.
Unguentum Gallæ (20).
Unguentum Hydrargyri (50).
Ung. Hydrargyri Ammoniati (10).
Ung. Hydrargyri Nitratis (7).
Ung. Hydrargyri Oxidi Flavi (10).
Ung. Hydrargyri Oxidi Rubri (10).
Unguentum Iodi (4).
Unguentum Iodoformi (10).
Unguentum Picis Liquidæ (50).
Ung. Plumbi Carbonatis (10).
Ung. Plumbi Iodidi (10).
Ung. Potassii Iodidi (12).
Unguentum Stramonii (10).
Unguentum Sulphuris (30).
Unguentum Veratrinæ (4).
Unguentum Zinci Oxidi (20).

The figures in parentheses show the percentage of the extract or other active ingredient in the ointment. The composition of each may be found in the section on Materia Medica under the title from which the preparation is named, except Unguentum, which will be found under the title ADEPS, and Unguentum Diachylon under PLUMBUM.

Ointments and Cerates are frequently ordered on extemporaneous formulæ, though the numerous official preparations of these classes would seem to give the physician a sufficiently wide field for selection. The basis is usually either the official Ceratum or Unguentum, but Petrolatum, Lard, Lead Plaster with a fixed oil, etc., may be employed. Lard is probably the best basis for all ointments, as it softens the skin better than any other similar substance. Its disadvantage is that it soon becomes rancid, so that preparations made with it must be quickly used. *Cerates* only differ from ointments in their firmer consistence, melting at temperatures above 104° F., while the latter melt below the ordinary temperature of the body. *Oleates* are described fully on page 103.

The process of compounding an ointment or a cerate is sufficiently simple, being generally a mere matter of triturating the ingredients together in a mortar, or of their incorporation on a slab by means of a spatula. Rarely will melting be required in the compounding of extemporaneous ointments. When extracts, powders or gritty substances are ordered, the ingredients should be first pulverized into a fine powder, then triturated with a small quantity of the basis into a smooth, impalpable paste, the remainder of the basis being added gradually, until the whole is thoroughly incorporated. A warm mortar may be required for hard extracts. Soluble salts should be triturated with a little water before adding the excipient. Camphor needs a little alcohol to enable it to be pulverized. Iodine should be rubbed to a fine powder, then a little alcohol added and finally the excipient by degrees. Sulphur Iodide requires persevering work with a small portion of olive oil. Borax should be triturated with glycerin and Red Mercuric Oxide with distilled water. A bone or horn spatula should be used for all ointments, as steel or iron blades will injure many substances, particularly alkaloids, free acids, tannin, iodine and several of the mercurial salts. Volatile substances are added last and quickly worked in, so that their evaporation may be as slight as possible.

Ointments are dispensed usually in amber-colored glass pots with wooden or metallic covers, or in porcelain jars called *Gallipots*. In hospital and dispensary practice the common chip pill-box is used, but soon becomes exceedingly dirty and disagreeable to handle.

Unguentum Iodoformi Compositum.

℞. Iodoformi, ... ʒj.
Ol. Anisi, ... ♏xx.
Ol. Rosæ,
Ol. Ylang-ylang, . . āā ♏v.
Ung. Aquæ Rosæ, . . . ℥j.
M. Fiat unguentum.
Sig.—Ointment.

Unguentum Anti-pruriticum.

℞. Camphoræ,
Chloralis Hydrat., . āā ʒj.
Tere una ad liquorem, dein
adde cum tritu—
Unguenti Aquæ Rosæ, . ℥j.
M. Fiat unguentum.
Sig.—Ointment for itching.

Vina, *Wines*,—when medicated are practically the same as tinctures. The menstruum directed to be used is the official White Wine (Vinum Album), which should contain from 10 to 14 per cent. by weight of absolute alcohol. It is however reinforced by the addition of alcohol to the amount of 15 per cent. in all the medicated wines except that of Ipecac., which has 10 per cent. In the two Ferric Wines the alcoholic reinforcement is in the shape of the tincture of sweet orange peel. The official Wines are 10 in number, 2 of which are not medicated and stand first in the following list; 4 are prepared by solution or admixture, 2 by percolation and 2 by maceration during seven days. They are—

Vinum Album, 10–14.
Vinum Rubrum, 10–14.
Vinum Antimonii, 0.4.
Vinum Colchici Radicis, 40.
Vinum Colchici Seminis, 15.
Vinum Ergotæ, 15.
Vinum Ferri Amarum, 5.
Vinum Ferri Citratis, 4.
Vinum Ipecacuanhæ, 10.
Vinum Opii, 10.

The figures placed after the first two show the percentage of absolute alcohol by weight required in each; those placed after the others indicate the quantity of the principal ingredient in grammes to each 100 cubic centimeters of the preparation.

PART III.

SPECIAL THERAPEUTICS.

Authorities. The principal authorities to whom references are made, with their initials, are included in the following list. When a statement is not followed by any reference by name or initial, it is to be understood as coming from the writer of this book.

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Applied Therapeutics may be studied either with the various therapeutic agents as the objects of chief consideration, as in the first part of this work; or with the different diseases and morbid conditions forming the objects of study in respect to their modification and treatment by medicines. In the following pages the latter method is followed, the therapeutics of each affection being exhibited in the form of an *Analytical Index* to the recognized text-books of the day. Every indication for the use of a drug, or statement regarding its value, is followed by the name or initial (in parenthesis) of its author: these references enabling the book to be used as an *Index to the Authorities*, for more strict differentiation between indicated remedies,—while the brief analyses given include sufficient material to make each section a synopsis of the most advanced therapeutics of the disease named in its title.

Abasia and Astasia.

Sodium Phosphate, by hypodermic injection, once a day for 25 days, cured a case of unilateral abasia-astasia (Charcot's "neurasthénie dimidiée"), in the municipal hospital at Jerusalem. The patient should be taught to walk as one teaches an infant, and compression of the posterior region of the trunk may be made with an appropriate bandage (Roux). [Compare HYSTERIA.]

Abdominal Plethora.

Cathartics, saline and hydragogue cathartics are of value in congestion of the portal circulation (B). **Saline Mineral Waters**, especially the purgative saline waters, as Vichy and Saratoga, in plethora of the abdominal viscera (B). **Grape-cure** has helped many cases, particularly those of hepatic engorgement and sluggish portal circulation; is best used after a preliminary course of powerful mineral waters (P). **Aliment** is very important; a dry diet is particularly indicated in cases of dyspepsia and hepatic enlargement due to excessive beer-drinking. Avoid much bread, also salted or twice-cooked meats, rich sauces, solid vegetables, especially cucumbers, soups and fruits. Biscuits, fresh meat, lemons, fish, fowl and game, may be used. [Compare HEPATIC CONGESTION, OBESITY.]

℞. Potassii Bicarbonatis,
Sodii Sulphatis, ... āā ʒ iv.
Solve in Ojss Aquæ, et adde—
Acidi Tartarici (cryst.), . ʒ ij.
Cork quickly and firmly. ⅓d to be taken thrice daily.

℞. Resinæ Podophylli, . . . gr. vj.
Ext. Colocynthidis Co., . gr. xij.
Ext. Belladonnæ Fol.
Alcoh., ... gr. iij.
Fiat massa, et div. in pil. no. xij.
Sig.—One pill every night.

Abortion.

Opium, cautiously in threatened abortion, is often very valuable (Wa); the tincture, ♏xx–xxx by rectum (Parvin); Opium to check uterine action and Ergot to restrain hemorrhage (B). **Ergot**, small tonic doses give excellent results in threatened abortion (P). **Tannin**, combined with Opium and Ipecac (W). **Cimicifuga**, to prevent miscarriage when uterus is irritable and prolapsed (R). **Savine**, the dried powder of the leaves, gr. xv–xx, thrice daily, is one of the most powerful remedies against the hemorrhage indicative of approaching abortion (Wa); the tincture in doses of 5 to 10 drops, every ½ to 3 hours, useful against the hemorrhage (P). **Viburnum Prunifolium**, in threatened and habitual abortion, has a very high reputation. **Aurum Chloride**, to avert the tendency to habitual abortion (B). **Iron**, with Potassium Chlorate, throughout the pregnancy, when fatty degeneration the cause of habitual abortion (McLane). **Asafœtida**, is highly efficient in habitual abortion; given in pills of gr. jss each, 2 daily, gradually increased to 10 daily, as soon as a new pregnancy occurs, and continued until the labor is over (Turazzo). **Tamponade**, of the cervix uteri, with cotton or sponge, dipped in vinegar or glycerin, when abortion is inevitable and it is desirable to hasten it and restrain hemorrhage. Empty the uterus thoroughly with the finger, placenta-forceps liable to do harm (Barker). **Abortifacients** (see page 58); Quinine and Ergotin, of each gr. ij in pill every 3 hours, the routine abortifacient of many irregular practitioners. Only by the production of such violent irritation of the abdominal and pelvic organs as generally endangers life, can the pregnant uterus be stimulated to expel its contents (P). The abortifacient effect of Savine and other drugs cannot be obtained unless by the administration of a quantity sufficient to endanger life (B).

℞. Ext. Ergotæ Fluidi, . . . ʒv.
Tinct. Opii Deodorat., . . ʒiij.
Syrupi Limonis, ... ℥j.
M. Sig.—A teaspoonful thrice daily.

℞. Acidi Tannici, ... gr. xv.
Pulv. Ipecacuanhæ, . . . gr. xij.
Extracti Opii, ... gr. iij.
Ft. pil. xij. Sig.—One every six hours.

Abscess.

Poultices to check or to assist in maturation; may be smeared with Belladonna or Opium (R). **Belladonna**, as plaster to subdue (B); painted around areola (Wa); internally often successful in aborting abscesses (R). **Calcium Sulphide**, half-grain doses frequently repeated, to abort abscess or to hasten formation of pus (B); gr. $\frac{1}{10}$ every hour or two, giving striking results in healing large abscesses (R). **Calcium Phosphate**, in large abscesses (R). **Mercury and Morphine**, the Oleate locally, diminishes induration due to old abscesses and prevents the formation of new ones (R). **Carbolic Acid**, a weak solution as injection after evacuation, also as a dressing (Lister). **Silver Nitrate**, a strong solution in Nitrous Ether if applied early to adjacent surface will check inflammation (B). **Blisters or Iodine**, as counterirritants around or adjacent to seat of disease (R). **Potassium Permanganate**, ʒj to the pint of water, to correct fetor (B). **Iodine**, the tincture injected after opening large abscesses (R); especially in scrofulous abscess (Wa). **Salicylic or Boracic Acid**, as dressings (B). **Sarsaparilla**, a very useful remedy in chronic abscess with profuse discharge (P). **Cod-liver Oil**, improves and lessens discharge from scrofulous abscesses (Wa). **Surgical.** Opening necessary in all deep abscesses, or when on face, near anus, mammary, or if danger of its opening into an internal cavity. Open with grooved director and forceps; never open a deep abscess with a plunge (Hilton). Drainage-tube may be required, also irrigation of the cavity and pressure (Agnew). Weaning of child necessary in chronic mammary abscess (Gross). Psoas abscess may result from strain or laceration of muscle, as by heavy lifting, effort to recover balance when skating, etc., as well as from spinal disease; the symptoms are often obscure, simulating those of chronic malaria. Early opening by lumbar incision necessary; then tonics, good food, and daily irrigation of the cavity with an antiseptic solution. [Compare SUPPURATION, CARBUNCLE.]

℞. Quininæ Sulph., ... ʒj.
Ferri Pyrophosphatis, . . ʒj.
Strychninæ Sulph., . . . gr. j.
Ac. Phosphor. Dil., . . ʒij.
Syrupi Zingiberis, . . . ℥ij.
Aquæ, q. s. *ad* . . . . . ℥iv.
M. Fiat mistura. Sig.—A teaspoonful thrice daily.

Acidity.

Acids, Hydrochloric or Phosphoric before meals; acid wine, a genuine Rhine wine best; Sulphurous Acid ♏v–xxx well diluted, for acid fermentation of starchy foods (R); acids after meals for alkaline pyrosis (R). **Tannic Acid**, useful in pill, gr. iv with ♏j of Glycerin (B). **Carbolic Acid**, often arrests eructations (B). **Alkalies**, after meals, for immediate relief, effects only temporary, Bicarbonates best (R); frequent use of alkalies enhances the mischief (B). **Nux Vomica**, ♏ij–iij of tincture before meals; is excellent in small doses (B); especially in acidity of pregnancy (R). **Pulsatilla**, ♏v of tincture every 4 hours in acid dyspepsia (P). **Silver Oxide**, extremely useful (B). **Manganese Oxide**, gr. x–xx of the purified black oxide relieves (B). **Kino**, a favorite remedy (B). **Ipecacuanha**, in acidity of pregnancy (R). **Mercury**, gr. ss of gray powder thrice daily, when acidity with clayey stools (R). **Atropine**, the sulphate, thrice daily by mouth, gave excellent results in a case of gastric hypersecretion of acid; after the third day pain had stopped and vomiting ceased. **Bismuth**, gives excellent results, combined with Opium or Morphine, sometimes with Magnesia (R). **Diet**, use lemon-juice, aërated or old bread, plain biscuits; avoid new bread, pastry, and vegetables.

℞. Bismuthi Subnitrat., . . ʒiij.
Acidi Carbolici, ... gtt. ij–v.
Mucil. Acaciæ, ... ℥j.
Aquæ Menth. Pip., . ℥iij.
M. Sig.—A tablespoonful 3 or 4 times daily for adults.

℞. Sodii Bicarbonatis, . . ʒij.
Spt. Ammoniæ Aromat., ʒij.
Tinct. Zingiberis, . . . ʒj.
Infus. Gentianæ Co. (U. S. P., 1870), q. s. *ad* ℥viij.
M. Sig.—A tablespoonful or two.

Acne.

Alkalies, internally, yield the best results in a number of cases (Bulkley); alkaline lotions for cases with seborrhea (B). **Borax**, a weak solution in rose-water (ʒj–℥viij), of great benefit locally in acne simplex (Wa). **Potassium Bromide**, in moderate doses, has proved curative in some obstinate cases (R). **Sulphur**, internally and as a lotion; in severe forms an ointment of the Iodide or Hypochlorite, ʒij ad ℥j (R). **Belladonna**, locally, is of some service, checking the abundant secretion from the sebaceous follicles (R). **Arsenic**, in old cases, especially in acne indurata, but often disappoints; given with Bromides it prevents the bromic acne (R); Arsenic Bromide is adapted to most cases of acne vulgaris (Pf). **Phosphorus**, is an excellent substitute for arsenic (B); the compound syrup of the Hypophosphites in acne indurata (R). **Mercury**, in lotion, is much employed (B); a weak lotion of the Bichloride to the face two or three times daily (R); the Iodo-chloride (gr. v–xv ad ℥) as irritant application (Fox); or ointments containing the Bichloride of Biniodide may be employed instead of the green soap application (Pf). **Glycerin**, internally, has been used with success (B). **Berberis**, ♏v of a fresh tincture thrice daily for the acne of girls at puberty. **Calcium Sulphide** is indicated in cases characterized by a tendency to pustulation (Pf). **Bismuth**, locally, as a cosmetic (B). **Magnesium Sulphate**, as a purgative daily before breakfast, in cases of acne vulgaris depending on derangement of the stomach and bowels (Duhring); the salt, finely triturated, is an excellent dusting-powder and in five-grain doses internally, 3 or 4 times a day, is often very efficient in acne vulgaris and other obstinate eruptions due to derangement of the gastro-intestinal tract. **Ergot**, is well used in various forms of acne (See ACNE ROSACEA). **Sapo Mollis**, as an active irritant in subacute cases, applied every night as long as bearable, then emollients until irritation subsides, when the soap should be removed (Pf). **Water**, hot sponging for 15 or 20 minutes several times a day, followed by Glycerite of Starch to allay irritation (R); the local use of very hot water is of the greatest benefit in all inflammatory forms of acne (Bulkley). **Puncturing** each apule with a lancet point, followed by very hot water, and ointments of Sulhur Iodide, Ammoniated Mercury, etc., diluted (Pf). **Diet and Hygiene,** :quire careful attention (B); powerful tonics are often required (Bulkley). Compare Acne Rosacea, Seborrhea.]

. Potassii Acetatis, . . . ʒiv–℥j.
Tinct. Nucis Vom., . . . ʒij.
Infusi Quassiæ, *vel*
Tinct. Cinchonæ Co., *ad* ℥iv.
M. Sig.—Teaspoonful in water after eals, as an antacid tonic.

. Magnesii Sulphatis, . . ℥jss.
Ferri Sulphatis, ... gr. xvj.
Acidi Sulphurici, . . . ʒij.
Aquæ, ... q. s. *ad* ℥viij.
M. Sig.—A tablespoonful in a glass of ater before breakfast.

℞. Sulphuris, ... ʒj.
Glycerini, ... ℥j.
Aquæ Rosæ, ... ℥vij.
M. Sig.—Lotion.

℞. Bismuthi Subnit., ʒj.
Ung. Hydr. Ammoniat., ʒij.
Ung. Aq. Rosæ, . . *ad* ℥j.
M. et fiat unguentum.

℞. Hydrarg. Iodo chlor., . gr. v–xv.
Adipis, ... ℥j.
Fiat unguentum. An irritating application, requiring care.

Acne Rosacea.

Resorcin, as paste with equal part of Zinc Oxide, applied to the affected art several times a day, to promote peeling of the skin in the treatment of cne rosacea; in 3 or 4 days the skin becomes like parchment, when the appliation must be stopped to avoid cracking of the skin, and a dressing of gelatin, lycerin, zinc oxide, and hot water is applied, covered with cotton wool; in a :w days the dressing will come off, bringing the skin with it. Some few danerous results have followed this practice, but there have been a number of ery satisfactory cases (Unna). **Ergot** is well used in acne rosacea and other orms of acne; a good fluid extract with glycerin and water, giving ʒss interally per diem (B). **Magnesium Sulphate,** finely triturated, is an excellent usting-powder for cases of acne rosacea; also in 5-grain doses thrice daily iternally (See Acne). **Bismuth,** the Oleate as an ointment, and the greased urface powdered over with a mixture of Oleate of Zinc, Bismuth Subcarbonate nd Starch (Shoemaker). **Antipyrin,** with Coca, often gives marked relief, when bnormal irritability of the gastric nerve endings leads to vaso-motor disturbnces of the nose and face (Whitla). **Bromides,** with Arsenic, for women, hen acne rosacea due to cessation of menstruation (Id). **Electricity,** the galanic current, 5 to 8 elements of an ordinary battery, both poles applied to the ose and continually moved about, or the anode on the zygoma and the nose ently stroked with the cathode; these applications repeated once in 2 or 3 ays, for at least 10 to 15 sittings, have proved uniformly successful in 31 cases Helbing). **Chloral** will aggravate rosacea.

. Antipyrini, ... ʒjss.
Extr. Cocæ Fluidi, . . ℥ij.
Tinct. Aurantii,
Glycerini, ... āā ℥j.
M. Sig.—ʒj thrice daily between eals. (*Whitla.*)

℞. Potassii Iodidi, ... gr. xl.
Potassii Bromidi, . . ℥j.
Liq. Acid. Arsenosi, . . ʒjss.
Tinct. Sumbul, ... ℥ij.
Aquæ Camphoræ, . *ad* ℥xij.
M. Sig.—℥ss in water after meals.

Actinomycosis.

Sodium Salicylate, produces amelioration of symptoms (Netter). **Potassium** dide, in full doses, 80 grains daily at first, diminished as its physiological ect is produced, is promptly curative, acting probably by augmenting tissue sistance. This drug has cured six human cases in Holland, and one in ance; also 71 out of 185 oxen so treated in Chicago (Netter).

Addison's Disease.

Arsenic, with cod-liver oil, gives the best results (Da C). **Iron** and other tonics are useful, especially a combination of the chloride, glycerin and chloroform (Greenhow). **Phosphorus**, has seemed to exert a beneficial influence (Wilks). **Adrenal Extract** has been employed in a few cases with some benefit while used. (See page 165.) **Treatment** must be symptomatic, and is of little use, the disease being always fatal (H).

℞. Tinct. Ferri Chloridi,
Spt. Chloroformi, . . . āā ℥j.
Glycerini, ... ℥vj.
M. Sig.—A dessertspoonful in water thrice daily. (*Greenhow.*)

Adynamia.

Cinchona, or Quinine, with Arsenic, for pale, badly-fed town-dwellers (R); as a general tonic when flesh flabby, skin perspiring (P). **Arsenic**, for swelled feet of old or weakly persons, and breathlessness from weak heart (R); as a tonic in continued doses of gr. $\frac{1}{60}$ to $\frac{1}{12}$ (Wa). **Nux Vomica**, in adynamia of drunkards; Tinct. Capsici ʒvj; Tinct. Nucis Vom. ℥ij; gtt. xx in water every four hours (B). **Calcium Phosphate**, when from prolonged town-life or overwork; gr. j with grain j each of Iron Phosphate and Calcium Carbonate as a dose (R); Hypophosphites of Lime or Soda, in nervous or general debility (R). **Iron**, promotes appetite and digestion; gr. j–iij of the Sulphate, or the official Iron and Aloes pill, or with Manganese (B); anemic subjects (R). **Hydrastine**, as substitute for Quinine, to promote appetite and digestion and improve assimilation (B). **Digitalis or Eucalyptus**, in debility with weak heart action (B). **Bitters**, especially Calumba and Gentian, are useful for a short time (B). **Sanguinaria**, when stomach needs stimulation (P). **Sarsaparilla**, in broken-down, syphilitic constitutions (P). **Orchitic Extract.** [See page 16]. **Alcohol** is of great value, but has been abused; hurtful when it increases temperature and pulse, dryness of tongue, etc. (B); a wine with much ether in debility of old age, especially where sleeplessness, indigestion and stomach cramps (R). **Aliment**, sugar and saccharine fruits, vegetables, oil, milk, cod-liver oil, wine of good body and strength (B); Porter or Rum-and-milk for town-living women (R). **Sea-bathing** is useful in chronic illness, with much debility (R). **Turkish Baths**, when debility is caused by the tropics, but caution necessary; when town-dwellers become stout and flabby, are easily tired, suffer from a lack of energy and from mental depression, a course of baths is beneficial (R). [Compare ANEMIA, CONVALESCENCE, NEURASTHENIA.]

Tonic Prescriptions.

℞. Liq. Potas. Arsenitis, . . . ♏x.
Ext. Nucis Vom. Fluidi, . ♏xx.
Tinct. Gentianæ Compos.,
Tinct. Cinchonæ,
Tinct. Calumbæ,
Vini Kolæ, ... āā ℥iv.
M. Sig.—A wineglassful after each meal.

℞. Tinct. Nucis Vom., . . . ℥ij.
Tinct. Cinchonæ, . . . *ad* ℥iv.
M. Sig.—A teaspoonful after each meal.

℞. Acidi Arsenosi, ... gr. j.
Quininæ Sulphat., ... ʒj.
Ferri et Potass. Tart., . . ʒij.
M. Ft. pil. no. xxx. Sig.—One pill after each meal.

℞. Quininæ Sulph., ... ʒj.
Strychninæ Sulph., . . . gr. j.
Tr. Ferri Chloridi, . . . ʒv.
Ac. Phosph. Dil., . . . ʒij.
Syr. Limonis, ... *ad* ℥vj.
M. Sig.—A teaspoonful in water thrice daily, in nervous debility.

After-pains.

Opium, more certain in action than any other remedy (Wa); Morphine and
tropine (gr. ¼ and gr. $\frac{1}{100}$), combined (B), hypodermically (Wa). **Bella-
onna**, as ointment, much used in France (L). **Camphor**, gr. x with gr. ⅛ of
lorphine, an effective remedy (B); ℥j in ℥vj of mucilage, tablespoonful doses
very hour or two (Wa). **Chloral**, will stop the pains, but large doses (gr. xx–
l) are necessary (R). **Chloroform**, the Linimentum Chloroformi, ℥j with
inim. Saponis ℥vj, applied on flannel to the abdomen (Barker). **Quinine**, gr.
-x night and morning, with the above chloroform liniment locally, in neural-
ic after-pains which do not yield to opiates, the uterus being tender on pres-
ire (Barker). **Gelsemium**, suspends them, large doses (♏xx) necessary (B).
imicifuga, relieves the pains, and allays general nervous excitement (P).
rgot, is better than Cimicifuga (R). **Poultices**, warm, over the hypogastrium,
ith soothing injections into the vagina (L).

Agalactia.

Ricinus, gr. v. of extract, or ʒj–ij of strong decoction, daily in water; also
e leaves, or an infusion, locally to mammæ (T). **Gossypium**, an emulsion
the seeds has repute in India as a galactagogue; a wineglassful of the de-
ction every 20 to 30 minutes (P). **Pilocarpus**, remarkably increases the se-
etions (B); Pilocarpine is a galactagogue, and probably the only example of
is class we possess, it distinctly increasing the secretion of milk in nursing
omen (M). **Tea**, a good black tea is thought to promote the milk supply.
ompare LACTATION.]

Albuminuria.

Aconite, in incipient albuminuria with high body-temperature (R). **Lead**,
minishes the albumin (R). **Turpentine**, gtt. ss–j, every 2 to 4 hours, or one
two drop doses night and morning, of great value in chronic albuminuria
thout other marked symptoms of Bright's disease (P). **Gallic Acid**, the most
ficient agent in the acute form to restrain loss of albumin (P). [See Aitken's
rmula below.] **Cannabis Indica** is indicated when bloody urine (R). **Chim-
hila**, has unquestioned power over albuminuria (P). **Cantharis**, ♏j of the
icture every 3 hours, after the subsidence of acute symptoms, especially
hen bloody urine (R). **Fuchsin**, in doses of gr. j–iij, completely arrested al-
minuria with edema in many cases (Bouchut). **Alkalies**, the citrates and
etates as diuretics (R); the Buffalo Lithia Water of Virginia is highly recom-
ended. **Strontium Lactate**, has been used with benefit, but should not be
ven when scanty urine or symptoms of uremia are present. **Nitro-glycerin**,
j of a one per cent. solution to dilate the peripheral vessels, relieving the
art and lessening the renal congestion (B). **Turkish Baths**, benefit by re-
ving the kidneys of work (R). **Milk-cure**, with buttermilk, has proved very
ficient in many cases (B). **Chalybeate Waters**, especially those having pur-
tive qualities, are beneficial (B). [Compare BRIGHT'S DISEASE.]

. Acidi Gallici, ... ʒj–ij.
Ac. Sulphurici Dil., . . . ʒss.
Tinct. Lupuli, . . ʒj.
Infusi Lupuli, . q. s. *ad* ℥vj.
Sig.—Tablesp. thrice daily.—(*Aitken*.)

℞. Liq. Ferri et Ammonii
Acetatis (U. S. P.), . . ℥vj.
Sig.—Teasp. to a tablesp. according to age, well diluted, thrice daily.
(*Basham*.)

Alcoholism.

Arsenic, for distressing vomiting, one drop of Liquor Arsenicalis (Fowler's
lution), before breakfast (R). **Capsicum**, in dyspepsia of chronic alcoholism,
d to induce sleep; also as a substitute for the alcohol; with Bromides or

Arsenic and bitters to assist in overcoming habit, by removing the distress at pit of the stomach; the tincture in 10-minim doses should be taken shortly before meals, or whenever there is a depression or craving for alcohol; it obviates the morning vomiting, and promotes appetite and digestion (R). **Ammonia**, a full dose (ʒss) of the spirit will often sober a drunkard speedily (R); a few drops of Liquor Ammoniæ, diluted, have prompt action (S); ʒj of the aromatic spirit with Capsicum (see formula below). **Ammonium Chloride**, is remarkably efficient in straightening up a subject of acute alcoholism; ʒss in ½ pint of water, swallowed at one draught, by a patient on the verge of delirium tremens, is said to quickly restore the faculties. **Ammonium Acetate**, the solution, in full doses, is one of the most efficient agents for quickly straightening up a drunkard. **Hydrastine**, the sulphate in doses of gr. $\frac{1}{50}$ increased to gr. $\frac{1}{20}$, hypodermically four times a day, is one of the "cures," and has been used for this purpose in Canada for many years. **Aurum and Arsenic Bromide**, the solution (Barclay's), is an excellent tonic remedy for alcoholism, and may be used by hypodermic injection, in doses of ♏x four times daily. **Kola** is a good general tonic for cases of chronic alcoholism. **Cinchona**, especially Cinchona Rubra, for gastric catarrh of drunkards (B); Quinine, gr. ij–vj daily to raise the nervous tone (P). **Nux Vomica**, for after stomachal disorders (B); in the tremor of chronic alcoholism is of much value (P); the tincture in 5-minim doses with 15 of Tinct. Capsici, in water every 4 hours, is exceedingly effective in diminishing the craving for spirits and sustaining the nervous system. **Strychnine**, the Nitrate, gr. $\frac{1}{30}$–$\frac{1}{15}$ hypodermically thrice daily for ten days, it is an absolute cure for dipsomania (Luton); a very valuable remedy for chronic alcoholism and dipsomania, not merely curing the attacks, but abolishing the desire for drink, the patients abstaining from spirits of their own accord (Pom[illegible]n-brak). **Glycozone**, is one of the very best remedies for the chronic gastric catarrh of chronic alcoholism (Edson). **Potassium Bromide**, ʒj every 4 to 6 hours in the "horrors" (B). **Phosphorus**, in chronic alcoholism, recommended by Anstie (R). **Opium**, cautiously, if at all (B); Morphine with tonics before meals for pain, nausea, and want of appetite (R). **Cocaine** has been pronounced of great benefit, restoring appetite, inducing sleep and promoting digestion, while it soothes the brain and induces a feeling of contentment and calm (R). **Cimicifuga**, is said to be useful in the treatment of the drunkard's stomach (R). **Chloral** is very successful, but must be cautiously used with old worn-out drunkards with weak hearts (B). **Picrotoxin**, small doses for the tremor, gr. $\frac{1}{20}$ repeated (B). **Lupulin**, is the best substitute for alcohol, and [illegible] is extremely serviceable in delirium tremens (B). **Zinc Oxide**, is very useful in chronic alcoholism, to diminish the craving, to relieve the gastric catarrh and lessen the tremor (B). **Keeley Injection** contains Strychnine and Atropine, [illegible]ne, also Codeine and Cocaine for subjects of the opium-habit. (*N. Y. Med. Record.*) [See under PATENT MEDICINES.] **Acute Alcoholic Poisoning** [se[illegible] see page 137] requires an emetic or the stomach-pump, cold douche to the head and breast, warmth to the feet and limbs. Artificial respiration may be required. Milk, mucilaginous drinks, and black coffee, are the principal remedies. A milk diet often creates a disgust for alcohol. [Compare DELIRIUM TREMENS, VOMITING, and NEURITIS.]

℞. Tinct. Capsici, ... ℥ss.
Potass. Bromidi, ... ℥ss.
Vel Liq. Potass. Arsenit., ♏l.
Vel Tinct. Nucis Vom., ʒij.
Spt. Ammoniæ Aromat., ℥iij.
Syr. Tolutani, . q. s. *ad* ℥vj.
M. Fiat mistura. Sig.—A dessertspoonful in water four or five times daily.

℞. Zinci Oxidi, ... ʒj.
Piperini, ... gr. xx. [illegible]
M. Fiant pil. no. xx. Sig.—One pill thrice daily.

℞. Tinct. Gentianæ Co., . . ℥ij.
Tinct. Calumbæ Co., . . ℥ij.
Tinct. Nucis Vom., . . . ♏lxxx[illegible]
M. Sig.—A dessertsp. before each meal, for rum-stomachs. (*Loomis.*)

Tinct. Nucis Vom., . . ʒj.
Tinct. Gentianæ Co., . . ʒiij.
Spt. Limonis, ... ♏vj.
Spt. Chloroformi, . . . ʒj.
Aquæ, ... q. s. *ad* ℥vj.
M. Sig.—One-sixth to be taken 3 or 4
ıes daily, for insomnia.

℞. Ext. Lupulini Fl., . . ℥j.
Ext. Aromatici Fl.,
Tinct. Capsici, . . } āā ʒvj.
Mucil. Acaciæ, . .
Aquæ Menth. Viridis, *ad* ℥iv.
Fiat emulsum. Sig.—A teaspoonful or
two as required.

Alopecia.

Cantharides, the tincture, 1 part to 8 of castor oil, well rubbed into roots of
ır, night and morning (Wa). **Arsenic**, ♏v of Liq. Arsenicalis ter die, exer-
es a more or less powerful influence (Wa). **Nitric Acid**, with olive oil, makes
erviceable liniment (Wa). **Pilocarpine**, has a decided influence on the growth
the hair (B). **Glycerin** in combination with the above remedies (Wa). **Sul-
ur Iodide**, has been found very effectual, used internally and externally
/a). **Thyroid Extract**, [see page 158]. **Oxygen**, applied under a rubber cap
ed to the head, into which oxygen was pumped, with entire satisfaction, in
case of a girl who had lost nearly all her hair in consequence of alopecia
eata (Stoker). **Frequent Shaving** may often save the hair in alopecia after
ıess. Use clean brushes with long bristles, and brush against the natural
of the hair. [Compare TINEA.]

Ol. Amygdalæ Expres.,
Aq. Ammoniæ, ... āā ℥j.
Ol. Rosmarini, ... ʒij.
Alcoholis, ... ℥ij.
Aq. Destillat., ... ℥ij.
Mellis Despumat., . q. s. *ad* ℥viij.
Sig.—Lotion for the hair. (*Wilson.*)

Tinct. Macis, ... ʒjss.
Olei Olivæ, . . q. s. *ad* ℥ij.
Sig.—Lotion for baldness. (*Hebra.*)

℞. Tinct. Cantharidis, . . . ʒjss.
Tinct. Capsici, ... ♏xx.
Glycerini, ... ℥ss.
Spt. Odorat., ... *ad* ℥vj.
M. Sig.—Hair tonic. (*Gross.*)

℞. Pilocarpin. Hydrochlorat., gr. j.
Aquæ Destillat., . . . ℥j.
M. Sig.—Ten to thirty drops twice
daily, according to age, to improve the
growth of the hair. (*Bartholow.*)

Amaurosis and Amblyopia.

Arnica, has long been a popular remedy for amaurosis in Germany; Man-
ir employed it with much success (P, Wa). **Rue**, in minim doses night and
ırning, for dimness of vision from functional amaurotic condition; Elgâjaki
/s it produces dimness of vision, and in smaller doses improves the eyesight
). **Strychnine** will cure amblyopia from lead, tobacco, and alcohol (B); gr.
hypodermically (Nagel); hypodermically in tobacco and traumatic ambly-
ia, and in progressive nerve atrophy not dependent on intercranial disease
). **Guaiac**, is advised for cases of amaurosis occurring in persons of rheu-
ıtic diathesis (Wa). **Santonin**, has given very satisfactory results in amau-
ıis (Wa). **Veratrine**, as lotion brushed over eyelids, brows and temples once
lay, is often useful, but should not be permitted to touch the conjunctiva, or
eat pain will result (Wa); [see formula below]. **Potassium Iodide**, in
ıblyopia from lead-poisoning (Wa). **Opium** with champagne, has caused
covery from tobacco amaurosis without the abandonment of the habit of
ıoking (Hutchinson). **Seton**, a small seton in the temple kept open for a
ng period, has been found effectual when other remedies failed (Wa).
naũrosis and Amblyopia are names formerly used to denote the various
rms of blindness, before ocular diagnosis became as exact as it now is.
mblyopia is still used to designate certain impairments of vision not accounted
r by any organic changes visible (*Roosa*).

℞. Veratrinæ, ... gr. x.
Ætheris, ... ʒij.
Alcoholis, ... ʒj.
M. Sig.—Use with a brush once a day over eyelids, eyebrows and temples.

℞. Strychninæ Sulphatis, . . gr. j.
Alcoholis, ... ʒj.
Aquæ Destillatæ, q. s. *ad* ℥iv.
Sig.—A teaspoonful thrice daily before meals, when not used hypodermically.

Amenorrhea.

Aconite, in sudden suppression from cold or wet feet (R, P). **Pulsatilla**, in sudden suppression (B); often of the greatest value in the functional form (P). **Iron**, when from anemia, the most frequent cause; small doses preferred; Solution of Acetate, or Ferri et Ammonii Citras (gr. ij), or Ferri et Strychninæ Citras (gr. j), also chalybeate waters; make a careful diagnosis before giving iron (B). **Aloes**, when dependent on anemia (B); at the periods, with hot pediluvia, friction, etc. (R, P). **Potassium Permanganate**, gr. j thrice daily increased to gr. ij, is the best of all remedies for bringing back the menses, having specific action on the uterine tissue (R); excellent in amenorrhea from cold feet, and is by far the best emmenagogue; in pill it may explode, best in capsule with powdered elm or licorice (Parvin). **Manganese Binoxide**, in pill, gr. ij thrice daily, is a very efficient emmenagogue. **Mercury**, the Biniodide is a certain and safe emmenagogue, gr. 1/16 in pill, four times daily. **Oxalic Acid**, is highly praised, gr. ½–¾ in mixture, every hour (Poulet). **Apiol**, when from functional inactivity; first give Iron for the blood; next aloëtic purgatives, then apiol (gr. xv) just preceding the period; or a daily dose for a week or several days before (B); the best emmenagogue next to Potass. Permang. (Parvin). **Senega**, a saturated decoction of the root, to extent of a pint in 24 hours, during the preceding two weeks, advantageous (P). **Polygonum**, has given excellent results when used in ʒss doses four times daily for a week (B). **Cimicifuga**, has been recommended (R); is of very great value (P). **Arsenic**, combined with Iron, when from functional inactivity of ovaries (B). **Aurum Salts**, in amenorrhea from torpor of ovaries (B). **Ignatia**, in suppression of hysteria (P). **Cinnamon**, causes a flow of blood to the womb (Goodell). **Indigo**, is considered very efficient in doses of from ʒj to ʒiv; larger doses produce nausea and vomiting. **Nux Vomica**, small doses of the extract, of benefit in some obstinate cases (Wa). **Silver Nitrate**, in substance, applied lightly to the os uteri, at time of the expected discharge (Wa). **Colocynth**, in chlorotic amenorrhea (P). **Ergot**, has cured when due to plethora (B); when anemia after use of iron (R); in chlorotic (P); ♏j every ½ hour for 5 or 6 hours the day before and that of the expected flow, is very efficient when the cessation is not due to anemia (A. A. Smith). **Senecio Aureus**, will provoke menstruation in cases of functional amenorrhea but will not do so when there is anemia or advanced phthisis (M). **Rue**, in functional form, ♏j–v of the oil (B, P). **Sanguinaria**, is indicated for functional amenorrhea in the absence of plethora (B, P). **Savine**, general atony; ♏v–x of the fluid extract (B, R, P). **Serpentaria**, with anemia or chlorosis (B). **Ammonium Chloride**, for headache (R). **Sitz-baths**, hot, for six days before period; mustard may be added at period; often effectual in sudden suppression (B). **Spinal Ice-bag**, to lower dorsal and lumbar vertebræ, or cold sponging; useful (R). **Electricity**, in atony of uterus and ovaries (B). [Compare ANEMIA, CHLOROSIS.]

℞. Olei Sabinæ,
Olei Rutæ, ... āā ℥j.
Tinct. Polygon. Hydropip., ʒj.
Ol. Amygdalæ Expres.,
Mucil. Acaciæ,
Aquæ Menthæ Pip., . . āā ℥ij.
Fiat mistura. Sig.—A teaspoonful two or three times daily. (*Bartholow.*)

℞. Tinct. Ferri Chloridi, . . . ʒiij.
Tinct. Cantharidis, ... ʒj.
Tinct. Guaiaci Ammon., . ʒiss.
Tinct. Aloës, ... ʒss.
Syrupi, ... q. s. *ad* ℥vj.
Fiat mistura. Sig.—A tablespoonful thrice daily, in simple atonic amenorrhea.
(*H. C. Wood. Dewees.*)

. Ext. Aloës, ... ʒj.
Ferri Sulph. Exsic., . . . ʒij.
Asafœtidæ, ... ʒiv.
Fiant pilulæ 100. Sig.—One pill after
ch meal, gradually increased to three.
(*Goodell.*)

℞. Quininæ Sulphat., ... ʒiss.
Extr. Nucis Vom., . . . gr. xij.
Olei Sabinæ, ... ʒss.
Aloës Socotrinæ, ... gr. viij.
Cantharidis, ... gr. xxiv.
Fiant pilulæ xlviij. Sig.—One pill thrice daily.

Anemia.

Nux Vomica, stimulates the blood-making organs, and is used as an adjunct restorative remedies (B). **Iron**, its chief value is to improve digestion, also furnish hematin to the blood; the astringent preparations are the best and ey should be given after meals; chalybeate waters are also useful (B). Some ersons require bland preparations, especially when the gastric mucous mem- rane is irritable; a pale and flabby tongue indicates large doses of the chloride r sulphate (R). **Arsenic**, as an adjunct to Iron, and when iron cannot be borne r fails (B). **Aurum Arsenate**, is highly beneficial; the solution of Aurum and rsenic Bromide renders excellent service in anemia. **Orchitic Extract**, has emed serviceable. **Adrenal and Thymus Extracts** have been used with bene- t. **Nuclein**, has rendered good service. **Bone Marrow**, is highly efficient in ernicious anemia. [See page 160.] **Cerebrinin**, has been used with good results. See page 164.] **Quinine**, for badly-fed town dwellers (R). **Hypophosphites**, re useful, but should not be given with iron, cod-liver oil, or stimulants (R). **alcium Phosphate**, in anemia of growing persons, and of women weakened by pid child-bearing or excessive menstruation (R). **Calcium Lacto-phosphate**, r nursing mothers, or in waste from suppuration (B). **Acids**, added to purga- ve salts as tonics to the mucous membrane (R). **Pepsin**, is recommended by ollmann. **Manganese**, alone not of much use; is best combined with Iron 3); is not, like iron, found in the feces, nor does it cause constipation (Wa). **epto-mangan**, is highly esteemed by many competent clinicians. **Gal- anization**, as an aid to remedies (B). **Cold Sponging**, needs great caution, as may lower the tone by minute degrees (R). **Diet and Hygiene**, of prime nportance. Nourishing, digestible food, in as large quantities as can be as- milated—milk, eggs, animal broths; afterward fish, poultry, game, mutton, tc. Moderate daily out-of-door exercise, in pure air, is indispensable. **Bath- g**, especially sea-bathing, aids restoration. **Wines**, often useful. Red wines re the best. [Compare ADYNAMIA, CHLOROSIS, CONVALESCENCE, LEUCOCY- HEMIA, LYMPHADENOMA.]

Tonic Prescriptions.

Tinct. Ferri Chloridi, . ʒiv.
Ac. Phosphorici Dil., . ʒvj.
Spt. Limonis, ... ℥ij.
Syrupi, . . . q. s. *ad* ℥vj.
Misce. Sig.—A dessertspoonful in water fter meals. To the above may be added ʒij of the Liquor Strychninæ Hydrochlo- atis of the B. P. (*Goodell.*)

Hydrarg. Chlor. Corr., . gr. j–ij.
Liq. Acidi Arsenosi, . . ʒj.
Tinct. Ferri Chlor.,
Ac. Hydrochlor. Dil., āā ʒiv.
Syrupi, ... ℥iij.
Aquæ, ... q. s. *ad* ℥vj.
Misce. Sig.—A dessertspoonful in a ineglassful of water after each meal, as alterative tonic. (*A. H. Smith.*)

℞. Ferri Sulph. Exsiccat.,
Potass. Carbonatis, . āā ʒij.
Syrupi, ... q. s.
Fiant pilulæ no. xlviij. Sig.—One pill after each meal, gradually increased to three. (*Blaud.*)

℞. Quininæ Sulphatis, . . . gr. xx.
Ferri Sulph. Exsic., . . gr. xl.
Strychninæ Sulph., . . gr. ss.
Fiant pilulæ xx. Sig.—One pill thrice daily. (*Bartholow.*)

℞. Massæ Ferri Carbonat., ʒj.
Acidi Arsenosi, ... gr. j.
Quininæ Sulphatis, . . gr. xl.
Fiat massa et div. in pilulas no. xl.
Sig.—One or two pills thrice daily.

Anesthesia, General.

Morphine, subcutaneously before the inhalation, diminishes danger, and lessens the after-pain if operation is performed (Nussbaum); Morphine gr. $\frac{1}{12}$ and Atropine gr. $\frac{1}{125}$, hypodermically, after emergence from anesthesia, will relieve the nausea and vomiting; a preliminary injection of Morphine lessen the stage of rigidity and spasm, enables a smaller quantity of the anesthetic to be used with full effect, prolongs the stage of insensibility, prevents shock and antagonizes the cardiac and respiratory depression (B). **Chloral**, as an aid to Chloroform in surgery and obstetrics, 10 to 15 grains given 20 minute before the anesthetic, seems to intensify the effect and enable a less quantity to be used, also tiding the patient over the excited stage (Brodnax); in children a full dose of chloral before anesthesia enables the latter to be obtained durin sleep without using force (Id). **Atropine**, is decidedly the best antagonist t the respiratory paralysis of Ether, and should be given hypodermically (gr. $\frac{1}{50}$ as soon as alarming symptoms manifest themselves (Amidon); the writer of this book has saved at least four subjects of chloroform-narcosis by the hypodermic use of Atropine after both heart and respiration had apparently failed **Alcohol**, ℥j–ij of whiskey or brandy before inhalation, to sustain the hear and prolong narcosis (B). [Compare page 115 for the general subject o ANESTHESIA.]

Anesthesia, Local.

Ether, as spray, projected upon the skin in a continuous stream, produces cold and local anesthesia by its rapid evaporation, and may be used for any minor operation. **Rhigolene**, a volatile petroleum product, freezes the part when sprayed thereon from a hand atomizer and produces local anesthesia. **Guaiacol** in sterilized olive oil, 1 part in 10 or 20, hypodermically, is a powerful local anesthetic [see page 292]. **Cocaine**, in 1 to 4 per cent. aqueous solutions injected hypodermically or applied to mucous membranes, produces profound local anesthesia [see page 278]; injected into the spinal canal between the 2d and 3d lumbar vertebræ, produces anesthesia of the lower limbs and the scrotum (Corning [illegible]). **Eucaine**, is equally effective and less dangerous than Cocaine [see page 283]. **Holocaine**, is too toxic for hypodermic use, but in a 1 per cent. solution instilled on the eye it causes complete, rapid and painless anesthesia [see page 283]. **Tropacocaine**, is less toxic than cocaine and equally anesthetic on the eye [see page 280]. **Orthoform**, is too insoluble for hypodermic use, but is efficiently employed as a dusting powder or ointment for painful surfaces where it comes into contact with exposed nerve endings [see page 283]. **Infiltration Method** is based on the theory that fluid infiltration of the tissues is the cause of the anesthesia produced by local injection of anesthetic solutions; distilled water being too painful, weak anodyne solutions are used for injection, as follows: *No. 1, Strong*,—Cocaine Hydrochloride gr. iij, Morphine Hydrochlorate gr. ss, Sodium Chloride gr. iij, Distilled Water, sterilized, ℥iij ʒiij, of which ʒvj may be used during one operation. *No. 2, Normal*,—Cocaine, Hydroch. gr. jss, Morph. Hydroch. gr. ss, Sod. Chlor. gr. iij, Distilled Water, sterilized, ℥iij ʒiij, of which ℥iijss may be used at one operation. *No. 3, Weak*,—Cocaine Hydroch. gr. $\frac{1}{8}$, Morph. Hydroch. gr. ss, Sod. Chlor. gr. iij, Distilled Water, sterilized, ℥iij ʒiij, of which a pint may be used at one operation (Schleich). [Compare the List of LOCAL ANESTHETICS AND ANODYNES on page 32.]

℞.		
	Chloroformi,	partes xij.
	Camphoræ,	partes ij.
	Tinct. Aconiti,	partes xij.
	Tinct. Capsici,	partes iv.
	Tinct. Pyrethri,	partes ij.
	Ol. Caryophylli,	partes ij.

Dissolve camphor in chloroform, a[illegible] the oil of cloves and then the tinctur[illegible] This is credited with almost magical local anesthetic effect.

(*Parson's Local Anesthetic.*)

Aneurism.

Potassium Iodide, in large doses (gr. xv–ʒss), 3 or 4 times a day, gives great relief and has cured (B); combined with recumbent position and restricted diet (R). **Veratrum Viride** aids surgical expedients; also in large internal aneurisms, with absolute recumbence and a little Opium to relieve pain, vomiting to be avoided (B). **Ergot**, with recumbent position; favors coagulation of the blood in sac (B); Ergotin (P). **Gallic Acid and Iron**, internally, have cured cases of aortic aneurism (Speer). **Chloroform** inhalation for great dyspnea (R). **Lead Acetate**, a valuable auxiliary to the more important items of rest, diet and mechanical appliances, gr. iij–v ter die (Wa); its use limited to the sacculated form (S). **Electrolysis**, galvano-puncture in deep aneurisms; not very successful (B). The object sought is the coagulation of blood within the aneurismal sac; cures have not been attained by this treatment, but in many it has produced great amelioration of the most distressing symptoms (Petit). **Glycerin**, by subcutaneous injection, to increase the coagulability of the blood [see page 127]. **Aliment**, milk regimen, for denutrition (B); a low diet, with absolute rest; Ergotin and Potassium Iodide for deep aneurisms beyond reach of surgical treatment (B). **Rest**, in recumbent posture, and light, unstimulating diet, are primary and essential elements in the treatment of aneurisms. **Surgical Treatment** includes ligation of the vessels, also pressure by a tourniquet or bags of shot, the operator's fingers, etc., applied to the main artery above the tumor, and the introduction of fine wire into the sac to favor coagulation.

℞. Potassii Iodidi, ... ℥j.
Tinct. Veratri Viridis, . ʒjss.
Tr. Cinchonæ Co., ... ℥j.
Tr. Cardamomi Co., . . ℥jss.
Tr. Gentianæ Co., . . . ʒss.
Syrupi Simplicis,
Alcoholis, ... aa ℥iv.
Aquæ, ... q. s. *ad* ℥xvj.
Misce. Sig.—℥ss thrice daily. Each dose has gr. xv of Potassium Iodide.

℞. Acidi Gallici, ... ʒj.
Ext. Ergotæ,
Digitalis, . . . aa gr. xx.
Fiat massa et div. in pil. xx.
Sig.—One every two hours.

℞. Plumbi Acetatis, . . . gr. xxxvj.
Extracti Opii, ... gr. iv.
Confectionis Rosæ, . . q. s.
Ft. pil. xij. One every four hours.

Angina Pectoris.

Aconite, believed by Gubler to be appropriate, and by Fleming to have been curative in many severe cases resisting other remedies (P). **Arsenic**, lessens or prevents paroxysms, if used in the intervals (Anstie). **Amyl Nitrite**, as inhalation, affords signal relief (R); unsafe in advanced degeneration of cerebral vessels and fatty degeneration of heart (B); gives great relief during paroxysms (Br). **Sodium Nitrite**, is less rapid in action than Amyl Nitrite, but is more efficient in preventing return of symptoms (Br). **Strychnine**, in the milder forms; very small doses, gr. $\frac{1}{100}$ to $\frac{1}{32}$ (P). **Glonoin**, doses of ♏ $\frac{1}{100}$ have been used with success (Pf, R). **Chamomile**, in pseudo-spasms of hysterical persons (P). **Ether**, aborts a mild attack (B); Sulphuric Ether in the nervous form, a spoonful immediately on commencement of attack will greatly mitigate it (Anstie). **Phosphorus**, often serviceable (R). **Morphine**, hypodermically, especially when cardiac dyspnea; strengthens the heart (R). **Turpentine** applications, hot over chest, to mitigate severity of the paroxysms, especially in the aged (Wa). **Quinine**, when intermittent (Wa); or when any malarial taint present (Br). **Brandy**, in frequent small doses, with hot bran poultice over heart and warmth to extremities. **Cocaine**, in doses of gr. ⅓ to ½ thrice daily for two days, proved curative in four very severe cases (Laskevitch). **Cactine** is efficient in pseudo-angina pectoris. **Chloral**, may be well prescribed in pseudo-agina pectoris (De Holstein). **Cratægus Oxyacantha**, the English hawthorn, a fluid extract of the berries, used in 40 cases of true angina with remarkably good results (Jennings).

Anthrax.

Nitric Acid strong, applied steadily, after thorough cleansing and drying, [illegible], to destroy the diseased mass (D). **Bromine**, to saturate the surface (D). **Nitri**[illegible]itric **Acid** fuming, is the preferable caustic (Greenfield). **Quinine** and **Carbolic Aci**[illegible]cid, internally, are indicated in all forms, also stimulants, as Ammonia, Ether, an[illegible]and Alcohol (Greenfield). **Eschar** should be promptly destroyed, to avoid con[illegible]contagion (R). **Excision** and **Cauterization** demanded, when from direct inocula[illegible]ulation; the two most successful measures (Greenfield). **Carbolic Acid**, a 2 or [illegible]or 3 per cent. solution injected subcutaneously around the pustule thrice daily, an[illegible]and applied on compresses soaked in the solution (Jarnvosky); of 24 cases so treate[illegible]ated 17 recovered (Matveieff).

Antrum Disease.

Hydrogen Dioxide, the solution, 1 to 12 of water, injected through the ostiu[illegible]ium for diagnosis of empyema of the antrum; if pus be present it is driven out, an[illegible]and fills the nose as a white foam (Brown). **Chloroform**, by inhalation, smal[illegible]mall quantities frequently, for treatment of acute catarrh extending to the antru[illegible]um, extremely efficient, both as a remedy therefor and as a preventive of suppura[illegible]uration therein (Potter). **Operative Measures**, that in most favor is to enter th[illegible] the antrum through the alveolus of the second molar tooth (Garretson); to giv[illegible]ive free drainage and enable medication of the diseased mucous membrane it i[illegible] is best to enter the antrum in its most dependent portion, through the upper par[illegible]art of the alveolus or immediately above it, between the roots of the 2d bicuspi[illegible]pid and 1st molar; a gold tube then fitted to the opening, so as to project beyon[illegible]ond the mucous membrane, will give free drainage, without sacrificing a sound [illegible] or even diseased tooth (Brown). **Boric Acid**, in saturated solution, as wash [illegible] to cavity twice a day, the after-treatment; occasionally injecting Iodine, Zinc Su[illegible]Sulphate or Bismuth Subnitrate (Id).

Anus, Fissured.

Hydrastis, locally, promotes healing (B). **Rhatany**, as injection, night a[illegible] and morning, after enema in the morning to move the bowels (Pf, Tr). **Iodofo**[illegible]orm, improves and relieves pain (B). **Iodo-tannin**, well applied, effective (B[illegible] (B). **Belladonna**, locally of great service for painful spasms of sphincter (P[illegible] (P). **Opium**, with gall-ointment for fissures of anus; mild purgatives should [illegible]d be simultaneously employed (R). **Sulphur**, as a mild purgative, to cause so[illegible] soft motions (R). **Tannin**, ʒj in Glycerin ℥ij, introduced on a tent, night an[illegible] and morning, with great advantage (Wa). **Collodion**, as protective covering (P[illegible] (P). **Potassium Bromide**, with 5 parts of Glycerin, as local application (R). **Silve**[illegible]ilver **Nitrate**, in solution, to the ulcer after careful cleansing and applying a 4 p[illegible] pe cent. solution of Cocaine, which prevents the pain due to the silver solution[illegible]ion, followed by Iodoform oint. gr. xxx to the ℥; this is most efficient (Adler[illegible]ller). **Castor Oil**, as a mild purgative (R); to keep motions soft (Br). **Surgic**[illegible]gical **Means**, the most efficient; forcible dilatation of sphincter or partial divisio[illegible]sion in severe cases, through the mucous membrane and a few fibres of sphincte[illegible]ter. Anal fissure, when uncomplicated with some other rectal affection, is curabl[illegible]able in many cases by non-operative methods of treatment (Adler). **Mercury**, a[illegible] an ointment of the Oxide, 30 grains to the ℥, has cured many cases (Id).

℞. Tinct. Krameriæ, ... ʒj.
Ext. Krameriæ, ... ʒij.
Aquæ, ... *ad* ℥viij.
M. Sig.—One-fourth as injection, night and morning, after using enema.

℞. Sulphuris, ... ℥j.
Pulveris Aromat.,
Confec. Rosæ, ... āā ʒij.
Misce. Sig.—One-third to be taken [illegible] bedtime as a laxative.

. Hydrarg. Chlor. Mitis, . . gr. iv.
Ext. Belladonnæ,
Pulv. Opii, ... āā gr. ij.
Ung. Sambuci, ... ʒj.
M. Sig.—To be applied frequently in
nal fissure. (*Allingham.*)

℞. Plumbi Acetatis,
Zinci Oxidi, ... āā gr. x.
Pulv. Calaminæ, ... gr. xx.
Adipis Benzoinat., ... ʒ iv.
M. Sig.—Ointment for use in anal
fissure. (*Allingham.*)

Aphonia.

Ignatia, in aphonia of hysterical women (P). **Atropine**, in hysterical apho-
ia and for fatigue of vocal cords, gr. $\frac{1}{120}$ to $\frac{1}{80}$, morning and evening (B).
thyl Bromide, for rapid anesthesia, during which it was suggested to the pa-
ents to shout out loudly their names, count numbers, etc.; this successful in 5
ses of hysterical aphonia in women (Arslan). **Nitric Acid**, ♏v–x of the di-
te acid, for hoarseness of singers, in fatigue of vocal cords, and when apho-
a is stomachal (B). **Benzoin**, the tincture by inhalation in laryngeal catarrh
r). **Oil of Rue**, as inhalation in chronic catarrh (Br). **Uranium Nitrate**, as
ray in very chronic catarrh (Br). **Alum**, gr. x–℥j aquæ, as spray, in chronic
ughs and hoarseness (R). **Borax**, a piece the size of a pea allowed to dissolve
the mouth (R). **Glycerite of Tannin**, locally in chronic inflammation of the
roat (R). **Sulphurous Acid**, by inhalation, spray, or fumigation, in clergyman's
honia (R). **Ipecacuanha** wine, as spray, when congestion of vocal cords
); in laryngeal catarrh (Br). **Ammonium Chloride**, as vapor inhaled, of
eat value in catarrhal aphonia (Wa). **Turkish Bath**, at commencement of a
verish cold (R); in acute laryngeal catarrh (Br). **Galvanism**, localized, the
st treatment for hysterical aphonia.

. Acidi Nitrici Dil., ... ʒij.
Tinct. Calumbæ, ... ℥j.
Aquæ, ... *ad* ℥iv.
M. Sig.—A dessertsp. in a winegl. of
ter thrice daily.

℞. Liq. Ammoniæ,
Aquæ, ... āā ℥j.
M. Sig.—A teaspoonful in a pint of
hot water for each inhalation.

Aphthæ.

Potassium Chlorate, the best remedy; a solution of gr. x to the ℥ as wash,
ne or with borax (Br); and gr. x to xx by the stomach (B). **Borax**, with
ney, or as glycerite of borax, frequently used (R); crystals allowed to dis-
ve in the mouth (W). **Sulphurous Acid**, as solution, strong or diluted, locally
), diluted as spray (B). **Mineral Acids**, formerly much used (B). **Mercury**,
dr. cum Creta in small doses to remove the indigestion on which aphthæ
en depend (B); Borax being used locally when aphthæ exist in the mouth
a). **Copper Sulphate**, a weak solution painted over mucous membrane (R).
tassium Iodide, gr. j–v in ℥j aquæ, locally (B). **Salicylic Acid**, one part
solved in alcohol to 250 of water (R). **Quinine**, gr. j every 2 or 3 hours, in
ants (B), especially when consequent on diarrhea (Br). **Coptis**, the infu-
n has repute in New England (B). **Bismuth**, freely to the parts (B); as a
al application (Br). **Glycerin**, will sometimes cure (R). **Rhubarb**, the com-
und powder to remove indigestion (Br); is highly useful in small doses
a). **Limewater**, as a mouth-wash, is much used.

. Acidi Sulphurosi, ... ʒij.
Aquæ, ... q. s. *ad* ℥ij.
M. Sig.—Mouth-wash, or may be used
a spray.

℞. Pulv. Rhei Co., ... ʒij.
Sacch. Lactis, ... q. s.
Triturat. et div. in pulv. xij. Sig.—
One powder thrice daily.

Apoplexy.

Aconite, when full, strong pulse, hot, dry skin, plethoric cases, is the best remedy (P); to lower blood-pressure and prevent further hemorrhage, where the pulse is strong and arterial tension high (Br). **Elaterium**, as a purgative; a large dose (gr. ij) in suppository with soap; or as an injection into the large bowel (P). **Croton Oil**, as purgative, a drop may be put on the back of the tongue (Br); ♏¼ or ⅓ each hour (R). **Colocynth**, as a derivative purgative (Br); appears to act well (P). **Cold Water**, often harmful, though frequently used; is injurious when face pale, surface cool, circulation depressed (B). **Electricity**, very mild galvanic currents to promote absorption; caution necessary, especially if much headache and vertigo (B). **Diet and Hygiene**, of great importance in patients subject to apoplexy; avoid stimulating food and drink, especially beer, over-eating, excitement, haste, exposure to hot sun, heated rooms, etc. At no subsequent period should a full animal diet or the use of undiluted wines be indulged in (A). **Diagnosis.** Should be carefully differentiated from alcoholism, with which it is often confounded. [Compare CEREBRAL CONGESTION, also page 137.]

℞. Tinct. Aconiti, ... ♏x.
Aquæ Cinnamomi, q. s. *ad* ℥ij.
M. Sig.—A teasp. every ¼ hour for 2 hours, then every half-hour.

℞. Ext. Colocynthidis Co., gr. xx
Olei Tiglii, ... ♏ij.
Fiat massa et div. in pil. iv. Sig.—One pill as required, until free purgation.

Appetite.

Ignatia, will correct diseased appetite (P); especially in hysterical subjects (Br). **Anthemis**, will stimulate the appetite. **Cannabis Indica**, produces a ravenous appetite. **Bitters**, to stimulate the appetite (R). **Food** should be savory and well cooked. **Habits** require examining into, when lost appetite complained of. **Fluoride** of Sodium or Potassium will produce almost total anorexia, and may be employed with advantage in bulimia (Da C). [Compare DYSPEPSIA.]

℞. Gentianæ, Quassiæ,
Cinnamomi, ... āā ʒij.
Sig.—Put into a pint of boiling water, and when cold strain; take a winegl. thrice daily as an appetizer.

℞. Anthemidis,
Quassiæ, ... āā ʒj.
Sig.—Put in a pint of boiling water, and when cold strain; take a winegl. thrice daily before meals as an appetizer.

Arthritis, Rheumatoid.

Aconite, highly spoken of as liniment, conjoined with internal use (Wa). **Cimicifuga**, when joints enlarged and much stiffened, and when traceable to uterine derangement, is very useful (R); when pains worse at night (Wa). **Viburnum Prunifolium**, the fluid extract with that of Cimicifuga, 20 drops of each thrice daily, gradually increased to 30, produced steady improvement in a well-marked case of eight years' standing, involving nearly all the articulations. **Iodine**, the tincture internally, said to be better than potassium iodide (R). **Iodoform**, 10 parts to 20 of Ether and 20 of Alcohol, as liniment to the joint, applied by a pencil, and covered with oiled silk (Gubler). **Iodides**, often signally benefit, especially when due to syphilitic, mercurial, or mineral poisoning (B); large doses of Potassium Iodide sometimes required (R); combined with Guaiac, or Corrosive Sublimate, often curative in cases resisting these remedies given separately (Wa); Potassium Iodide should always be fairly tried (Da C). **Guaiac**, the ammoniated tincture, in doses of ʒj–ij in milk, often gives excellent results (Da C). **Colchicum**, with alkalies, extremely useful (B). [See GOUT, for formulæ.] **Arsenic**, when referable to nervous affections (B); as a bath containing ℥iv washing soda and gr. xx of Sodium Arsenate; in large doses continued, sometimes of great benefit but action is capricious (R); in small doses is of great benefit (Da C). **Aurum**, the Bromide of Gold and Arsenic has proved curative in arthritis deformans, characterized by great pain, stiffness and swelling of the joints (E. A. Wood). **Lithium Salicylate**, very efficient in acute and progressive subacute articular rheumatism, and has some effect also in chronic cases where some of the joints are deformed, swollen and painful; ʒj may be given daily, in doses of gr. vij to x, in water (Vulpian). **Lithium Bromide**, of great value in acute and chronic (B). **Phenocoll**, with Piperazin, 15 grains of each daily, in a pint or more of carbonated water, has rendered good service in gouty and rheumatic affections. **Piperazin**, should be used in all cases of difficult diagnostic differentiation for its remarkable power over uric acid and urate concretions. **Potassium Bromide** sometimes allays the severe pain (R). **Arnica**, the tincture and infusion are said to be of great value (P). **Cod-liver Oil**, internally and locally, of much value (R). **Baths**, Turkish or sulphur; the cold douche, which may be slightly warmed in winter, use for one or two minutes and rub dry (R). **Dry Heat**, by the Tallerman apparatus, has been used in many cases with great benefit; in my experience it has very little value in this affection (W). **Adhesions**, may be broken up under anesthetics (Da C). **Massage** may be used to ameliorate the condition in chronic cases where a cure cannot be obtained (Da C). **Counterirritation**, by the actual cautery or flying blisters to the affected articulations, passive movements of the joints, sulphurous baths, in conjunction with Potassium Iodide internally in doses of 7½ to 30 grains in the 24 hours (Letulie).

℞. Vini Colchici Seminis, . ʒ iij.
Spt. Ammon. Aromat., ʒ xiij.
M. Sig.—A teasp. every 3 hours, until some physiological effect is produced. (B.)

℞. Lithii Bromidi, ... ʒ iij.
Syr. Zingiberis, ... ℥ ss.
Aquæ, ... ℥ jss.
M. Sig.—A teasp. thrice daily, conjointly with a lotion of the same.

Ascites.

Digitalis, when ascites is part of a general dropsy due to cardiac or renal diseases; is of the greatest service, except where aortic regurgitation and cardiac hypertrophy (P); a fresh infusion the best preparation (R); its action increased by combination with Squill and Mercury (Br). [See formula below.] **Jalap**, the most generally approved hydragogue purgative is the compound powder of Jalap with Podophyllum (B); with Potassium Bitartrate, combined in form of electuary, may be persevered with daily, though apt in some cases to cause gastric derangement (Saundby). **Stillingia**, in ascites due to hepatic changes (B). **Elaterium**, as hydragogue cathartic, gr. ⅙, with a grain of Ext. Hyoscyami, and a drop of some aromatic oil, is the most efficient of its class in ascites but its action is very exhausting (W); cautiously in debilitated subjects, and is contraindicated where gastro-intestinal irritation or inflammation present (B). **Arsenic**, when ascites is due to feeble heart, and in that of old age (B); did excellent service after tapping in a woman aged 82, from whom the writer removed 6½ gallons of ascitic fluid at one tapping, when almost moribund, with the result that she lived ten years longer (Potter). **Diuretin**, is often of very marked benefit, especially in cases of cardiac and renal origin. [See under DROPSY.] **Aurum**, has an ancient reputation; is efficient in ascites due to chronic hepatic disease (Gœtzner), or induration of the abdominal organs (Schroff). **Diuretics**, are of little use when the accumulation is excessive, the venous pressure seems to be too great for them to act (Saundby). **Copaiba** is an excellent remedy in hepatic dropsy (Br); the resin in doses of 10 to 15 grains often serviceable in cases of moderate effusion (Saundby). **Milk-diet** is an ancient remedy for ascites, and often successful, causing profuse alvine and urinary discharges (B); is sometimes very serviceable when the renal action is inadequate (Br). **Surgical**, paracentesis abdominis should be done in all cases where excessive effusion; laparotomy and washing out of the peritoneal cavity, in cases of tubercular peritonitis with effusion, which has recently been treated successfully thereby (Saundby). [Compare DROPSY.]

℞. Potassii Bitart., ... ℥ss.
Mellis, ... ʒj.
Sig.—A teasp. every 2 hours until bowels are freely moved.

℞. Resinæ Copaibæ, . . . ʒiij.
Alcoholis, ... ʒv.
Spt. Chloroformi, . . . ʒj.
Mucil. Acaciæ, ... ℥ij.
Aquæ, ... q. s. *ad* ℥xij.
M. Sig.—A tablesp. thrice daily.

℞. Potassii Bitart., ... ℥ss.
Pulv. Jalapæ, ... ℥jss.
Mellis, ... ʒj.
Sig.—A teasp. every 2 hours until bowels are freely moved.

℞. Hydrarg. Chlor. Mitis,
Pulv. Digitalis,
Pulv. Scillæ, . . . āā gr. vj.
Fiat massa et div. in pil. vj.
Sig.—One pill thrice daily, in ascites from hepatic changes.

Asphyxia and Apnea.

Of the New-Born.—Clean the mucus out of nostrils and throat; catheterize the trachea, and suck up the mucus. Marshall Hall's method,—by placing child on abdomen, then bringing into lateral posture, repeating slowly and deliberately. Schultze's method,—by placing the thumbs upon the anterior surface of thorax, the indices in the axillæ, and the other fingers along the back, the face of the child being from you; rotate the child, by swinging upward, so that the inferior extremities turn over toward you. In a moment re-rotate to the original position. Do not support head or legs in the forward rotation; their bending upon or toward the abdomen gives a forced expiration.

From Foreign Bodies in Air Passages.—If the foreign bodies are round and smooth, invert the patient head downwards and strike upon the back. The bristle-probang is a good instrument for the removal of fish-bones, coins, etc., from the gullet; or a pair of curved forceps will often render good service. The writer removed a gold plate with three teeth attached, from the esophagus of an insane woman, by passing down a curved piece of stout wire, having the end bent upon itself to form a hook. After the hook was passed to one side of and below the obstruction, the wire was half rotated, so as to engage the plate, which came up on the second trial of the improvised instrument. Tracheotomy or Laryngotomy may be necessary, as a final resort.

From Drowning.—Remove the person from the water as rapidly and gently as possible, turn the face downwards for a moment and depress the tongue, in order that water, mucus, etc., may be removed from immediately over the entrance of the windpipe. Give the patient plenty of fresh air, fully exposing neck and chest to the breeze, unless that be inclement. Turn gently on the face, one forearm being under the forehead, and raise the body up that the water may have free discharge from the mouth. Place the patient upon the side and apply stimulants (Ammonia, etc.) *near* to the nostrils; or the cold douche to the face and chest in order to excite respiration.

The above measures being ineffectual, convey the body to the nearest convenient spot, strip it carefully and dry it, and place it on a warm bed, with head and shoulders slightly raised, and at once employ one of the following methods:—

Silvester's Method.—Pull the tongue forward, to prevent obstruction to entrance of air into the windpipe; produce expansion of the chest by drawing the arms from the sides of the body and upwards until they almost meet over the head. Then bring the arms down to the sides again, causing the elbows almost to meet over the pit of the stomach, thus producing contraction of the chest. This imitation of the act of respiration should be continued at the rate of fifteen or sixteen times a minute, as in health.

Marshall Hall's Method.—The person should be placed flat on the face gentle intermittent pressure being made with the hands on the back, the body turned on the side, or a little beyond, then on the face, and the same pressure, etc., continued as at first. The whole body must be worked simultaneously. The same number and frequency of these artificial processes of respiration should be employed as in the other method.

The Michigan Method.—Lay the body face down, the head upon the arm, and stand astride it; grasp it then about the shoulders and armpits, and raise the chest as high as you can without lifting the head quite off the arm, and hold it about three seconds; then replace the body upon the ground, and press the lower limbs downward and upward, with slowly-increasing force, for ten seconds; then suddenly let go, to perform the lifting process again.

Whichever process be employed, the effort to restore the temperature of the body must be maintained, the body being well rubbed in an upward direction with the hands, with warm flannels, etc.; bottles of hot water, hot bricks, etc., being applied to the stomach, the axillæ, the soles of the feet, etc., stimulants and beef tea being judiciously administered when restoration is about taking place. The attempts at resuscitation must be persevered in for several hours, if necessary. In artificial inflation, always press the larynx and trachea against the vertebral column, so as to close the esophagus and thus prevent the air entering the stomach. Laryngotomy or Tracheotomy, with or without catheterization, or forced insufflations of air or oxygen, have proved successful, as also has electro-puncture (Garratt).

After Long Submersion is Recovery Possible?—According to Harley, dogs kept under the water 1½ minutes always died, if water had entered the lungs. If it had not, the trachea being plugged, they survived a submersion of 4 minutes. When persons rise after sinking they usually get some air, and less speedily come into a state from which recovery is impossible. The greatest period between the last inspiration and the stoppage of the heart is 4 minutes. Some think that no recovery has been made after complete cessation of the heart's action. We infer that after complete submersion for 5 minutes recovery is improbable, unless the person had been previously choked or in a fainting state, so that no water entered the lungs. But in Anderson's case, the patient had been under water at least 15 minutes, and in Garratt's the time was variously estimated at from 15 to 60 minutes.

When is a Case Hopeless?—Harley says, "If the eyes are open, the pupils dilated, the conjunctiva insensible, the countenance placid, the skin cold, frothy mucus round the nostrils and mouth, no attempt at respiration, and the heart's action inaudible (when the ear is applied to the chest), the case is hopeless."

Signs of Death.—The following have been suggested as methods of deciding whether death has occurred: Tie a string firmly about the finger; if the end of the finger becomes swollen and red, life is not extinct. Insert a bright steel needle into the flesh; if it tarnishes by oxidation in the course of half an hour, life may be considered not extinct. Inject a few drops of Liquor Ammoniæ under the skin; during life a deep red or purple spot is formed. Moisten the eye with Atropine; during life the pupil will dilate. Look at a bright light or at the sun, through the fingers held closely side by side; during life the color is pink; after death a dead white. After death a dark spot is said to form gradually on the outer side of the white of the eye, from drying of the sclerotic, so that the dark choroid shows through. Putrefaction is an absolute sign of death; better delay for it than run any risk of burying alive.

Asthenopia.

The proper glasses; cold douche; rest of eyes. **Atropine**, systematically instilled, to prevent strain, and control spasm of the accommodation (C); cautiously in persons over 35 or 40 years old. [Compare EYE DISEASES, MYOPIA.]

Asthma.

Potassium Iodide, when from acute bronchial catarrh, gr. xv–xx each 2, 3, or 4 hours (R); the best medicament to suppress the asthmatic attack, in bronchial asthma, is Potassium Iodide and Chloral (Lazarus); is the specific in asthma, if any drug can be so called; should be given with Lactucarium (Sée). **Chloral**, is highly efficient in spasmodic asthma; may arrest a paroxysm (R). **Paraldehyde**, ♏xlv–ʒj, used in 30 cases of asthma with rapid and complete relief in most and lessening of distress in the others (Hearder). **Nux Vomica**, in nervous subjects (B); often of great benefit in spasmodic asthma (P); the tincture, in drop doses every five minutes has rendered extraordinary results in both cardiac and bronchial asthma, and in asthma of peripheral reflex origin, as from phimosis (Macfarlan). **Antipyrin**, is successfully employed in bronchial asthma. **Aconite**, in spasmodic (P); often averts the attack, if given at commencement; useful also in the asthma following coryza and sneezing in children (R). **Ipecacuanha**, the wine as spray to the fauces, sometimes useful in severe bronchial asthma, but not of much service in genuine asthma (R); nauseant and emetic doses in the spasmodic form (B). **Lobelia**, gtt. x of the tincture every ¼ hour during paroxysm; ♏x ter die, with additional doses at night, in bronchitic asthma when worse at night; cautiously if heart disease (R); often gives permanent relief (B). **Pilocarpine Hydrochlorate**, gr. $\frac{1}{8}$ in water, at bedtime, promptly and effectively relieves, in cases of bronchitic asthma with hypertrophic rhinitis; in some of nine years' standing it apparently gave permanent relief (Wyss). **Grindelia**, gives relief in spasmodic form (B); three grains of extract thrice daily, to prevent attacks, or ♏xx–xxx of fluid extract every half-hour or hourly from onset of paroxysm (R). **Arsenic**, as cigarettes, as well as by internal administration (B); ♏j of liquor arsenicalis ter die, in attacks from bronchitis, local irritation, etc., allied to hay fever (R). **Belladonna**, relieves paroxysm when expectoration abundant, skin cool and moist (B); internally in large doses, also in cigarettes (Br). **Atropine**, hypodermically is more efficient, gr. $\frac{1}{60}$ at bedtime to abort morning paroxysm (B); large doses required, but very satisfactory (R); very much valued by Salter and Sée (P). **Duboisine**, may be used instead of Atropine. **Stramonium**, twenty grains of the dried leaves or ten of the powdered root may be smoked; Datura is sometimes better; Stramonium preparations are ofte of bad quality, asthmatics advised to grow the drug themselves (R). **Cocaine** hypodermically, is used with the best results, even where other remedies fail to relieve (Mosler); the leaves of the coca-plant make the best cigarett for asthma (Nachtigal). **Chloroform**, inhaled from warm water; anesthet relieve, but increasing doses required, leading to habit (R). **Ether**, in full do may avert a mild attack (B). **Amyl Nitrite**, inhaled, quickly checks spasmo asthma (R). **Ethyl Iodide**, very valuable in spasmodic form, and lessens l bility to subsequent attacks; ♏v–xx thrice daily by inhalation (B). **Canna Indica**, has been useful (R). **Sulphurous Acid**, by inhalation, spray, or fu gation (R). **Morphine**, hypodermically, quickly cuts short a paroxysm (B); some cases morphine will induce a paroxysm (R). **Oxy-camphor**, acts l morphine on the respiratory centre, and is very efficient in many forms dyspnea [see page 683]. **Adrenal Extract**, is very useful in bronchial asth (Solis-Cohen). **Apomorphine**, gr. $\frac{1}{10}$ hypodermically, has been found effecti or gr. $\frac{1}{12}$ every 3 or 4 hours in camphor water, with or without Morphine Ipecacuanha. **Hyoscine**, the Hydrobromate, gr. $\frac{1}{200}$, with Morphine Sulph gr. $\frac{1}{6}$–$\frac{1}{4}$ and Strychnine Sulphate gr. $\frac{1}{60}$–$\frac{1}{40}$, the best combination for the p oxysm (S. Solis-Cohen).

Euphorbia Pulifera, ʒss–j of the fluid extract thrice daily, used with exc lent results in asthma and asthmatic bronchitis (Dujardin-Beaumetz). **B mides**, relieve but soon lose effect (R). **Eucalyptus**, smoked with Stramon Belladonna, Tobacco (B). **Quinine**, after acute symptoms subside, as anti retic to succeeding fever and restorative tonic (B). **Potassium Nitrate**, the alation of fumes of burnt nitre paper will sometimes avert a paroxysm; differ-nt methods of preparation useful for different cases (R). **Silver Nitrate**, some-imes injected into trachea (R). **Chamomile Oil**, has been found very service-ble (P). **Sanguinaria**, is very useful in humid asthma, and occasionally so in he spasmodic form (R). **Antimony**, in an affection of children like asthma, issolve a grain of Tartar Emetic in half a pint of water, and give a teaspoon-ul of this every ¼ hour for the first hour, then hourly; if vomiting induced, essen the dose (R). **Coffee**, a small cup of very strong coffee often useful in a aroxysm (R); asthmatics should not use it as a beverage (P). **Tobacco**, moking, sometimes relieves (R). **Pyridine**, the fumes are highly efficient Sée). **Asafœtida**, has been recommended (R); palliative only (P). **Colchi-um**, in gouty subjects (R). **Oxygen** inhalations are serviceable, but should ot be used if heart disease is present (R). **Carbonic Acid**, in 5 to 10 per cent. olution, by inhalation, is well borne and renders good service (P). **Carburetted Iydrogen**, the inhalation of ordinary illuminating gas for 3 minutes never ailed to abort a paroxysm in a lady who had sought professional assistance in ain (White). **Galvanism**, of pneumogastric often relieves, + pole beneath astoid process, — pole to epigastrium. Faradism of no use (B). **Prophylaxis**, voidance of exciting causes, especially indigestible food, wet, damp, and sud-en changes of temperature. Attention to the stomach will do most for many sthmatic patients. An important point is to take the heaviest meal early in the ay, and very little solid food after 2 P. M. Shower-bath and out-of-door ex-rcise, not however to a fatiguing extent (R). In special cases of reflex origin om exposed nerve-filaments, operative treatment of the nose and naso-pharynx, y galvanic cautery or otherwise is required (Lazarus). [Compare DYSPNEA.]

. Ammonii Bromidi, . . gr. clx.
Ammonii Chloridi, . . gr. xc.
Tinct. Lobeliæ, ... ℥iij.
Spt. Ætheris Comp., . . ℥j.
Syrupi Acaciæ, q. s. *ad* ℥iv.
M. Sig.—A dessertspoonful in water, ery hour or two, for the paroxysm.
(*Pepper.*)

. Ext. Grindeliæ Fluidi, ℥ss.
Ext. Lobeliæ Fl., . . . ʒij.
Ext. Belladonnæ Fl., . ʒj.
Potassii Iodidi, ... ℥iij.
Glycerini, ... ℥iij.
M. Sig.—A dessertspoonful as required.

. Ext. Stramonii, . . . gr. ij.
Potassii Iodidi, . . . ʒjss.
Ammonii Carbonatis, . ʒj.
Tinct. Lobeliæ, . . . ʒjss.
Aquæ Chloroformi,
q. s. *ad* ℥viij.
Ft. mistura. Sig. — A tablespoonful ery four to six hours.

Arsenical Cigarettes.

℞. Sodii Arsenatis, ... ℥ss–j.
Aquæ Destillatæ, . . . ℥j.
Moisten unsized white paper, and roll into cigarettes, each containing gr. ¼ to gr. j of the salt. Two or three of these to be inhaled daily. (*Bartholow.*)

℞. Belladonnæ Fol., . . . ʒj.
Stramonii Fol.,
Hyoscyami, . . . āā ʒss.
Extracti Opii, ... gr. iij.
Aquæ Laurocerasi, . q. s.
Dissolve the opium in the water, and moisten the leaves therewith. When dry, roll into twelve cigarettes. Smoke two to four daily. (*Trousseau.*)

℞. Spt. Ætheris Compos.,
Liq. Morph. Sulph.,
(gr. j ad ℥j), . . āā ℥j.
M. Sig.—A teaspoonful every half-hour or hour during the paroxysm.

Astigmatism.

Atropine, a weak solution to aid examination of the eye by dilating pupil and ralyzing accommodation (B). **Duboisine**, as substitute for atropine, has more pid action, with shorter duration of effects and less conjunctival irritation. **asses**, of suitable form, cylindrical in simple astigmatism, bi-cylindrical in ixed astigmatism. **Pray's Test Letters**, to determine degree and direction of e defect (C). [Compare EYE DISEASES, MYOPIA.]

Atheroma.

Phosphorus, in minute doses, with cod-liver oil (B). **Arsenic**, often of great value in atheroma, especially where imperfect action of kidneys (Br); indicated when there are puffy eyes, drowsiness, intellectual torpor (B). **Lemon-juice**, daily used, is said to retard atheromatous degeneration of the vessels. **Aurum and Arsenic Bromide** is very efficient in atheroma and calcareous degeneration of the arteries (Barclay). **Quinine**, gr. iij–x daily, in atheroma, is used with advantage (B). **Ammonium Bromide**, to promote absorption of deposit (Wa). **Digitalis**, may be useful in general capillary atheroma; cautiously! (W). **Cod-liver Oil**, with Phosphates, Hypophosphites, or Calcium Lactophosphate, in combination (B). [Compare ANEURISM.]

Atrophy.

Cod-liver Oil, has proved beneficial (Wa). **Olive Oil**, by inunction, every 12, 6, or 4 hours, successfully employed (Wa). **Arsenic**, has had remarkable success in muscular atrophy (Tr). **Electricity**, in progressive muscular atrophy, the induced current very strong at first, then weaker as improvement; interrupted currents from vertebral column and plexuses to nerves of affected muscles; in more extended forms, the constant current to the nerves, the induced to the muscles (Ros). **Massage**, removes the waste products and restores the muscular power (Br). [Compare EMACIATION, LOCOMOTOR ATAXIA.]

Balanitis.

Mercury, Hydr. Chlor. Corr. gr. j to ℥jss Aquæ Calcis, as lotion, if not much inflammation (Br). **Oil**, on linen, to inflamed part beneath foreskin, which must be again drawn forward; strict cleanliness. **Astringent Lotions**, of Alum or Zinc Sulphate, with warm water injections (Br). **Lime-water**, the best lotion if much inflammation (D). **Tannin**, in alcohol, equal parts, as dressing after washing with a weak solution of common salt. **Carbolic Acid**, a 5 per cent. solution, on cotton rag after washing, thrice daily, is generally sufficient. [Compare PHIMOSIS, GONORRHEA.]

Bed-sores.

Alcohol, Brandy, or Eau-de-Cologne, to harden skin of parts exposed to pressure (R); as wash to parts threatened (B). **Glycerin**, or glycerin cream, rubbed over the parts exposed to pressure, after washing, morning and evening, is one of the best preventives (R). **Alum**, ℥ss, whites of four eggs, Tinct. Camphoræ ℥ij, an excellent application (B). **Charcoal**, sprinkled over the black slough, which then should be covered with a poultice (R). **Galvanic Couplet**, of zinc and silver, connected by a copper wire; one element on sore the other on the adjacent part (B). **Silver Nitrate**, a solution (gr. xx ad ℥j) to b painted on the threatened but unbroken skin, as soon as it becomes red, wi prevent sores; if Nitrous Ether solution be used, gr. v to the ℥ is enough (R **Iodoform**, dusted over sores (R). **Linen**, air-dried better than that whic ironed or mangled, by reason of its greater softness. **Aristol**, is an excel application.

Beriberi.

Methylene Blue, caused rapid amelioration of all the symptoms in ele cases (Thur). **Digitalis** or **Strophanthus**, small doses seem to do good in cardiac cases (Mn). **Nitroglycerin**, full doses, ♏iij–v of the one per cent. s tion every ¼ or ½ hour, when signs of acute cardiac distress appear (Sim **Amyl Nitrite**, by inhalation in sudden cardiac attacks, pending the action nitroglycerin (Mn). **Bleeding** from the arm or external jugular, 8 or 10 oun if signs of cardiac distress or failure persist and increase, in spite of the abo mentioned drugs (Id). **Oxygen** inhalations, are worth trying in cardiac cases. **Magnesium** or **Sodium Sulphate,** in small and repeated doses from the outset, to counteract constipation and drain the tissues of fluid (Mn). **Potassium Bromide** and **Aconite,** with anodyne liniments, for cramps and excessive muscular hyperesthesia (Id). **Strychnine, Arsenic** and **Silver Nitrate,** as tonics for the nervous and muscular complications. **Medication** should be purely symptomatic, no drug known has any specific influence on the disease (Mn); the symptoms are treated as in other forms of neuritis (Ty). **Faradization** and **Massage,** are of great service for the muscular atrophy and cutaneous anesthesia; but should not be employed until the muscular hyperesthesia has subsided (Mn). **Diet,** should be nutritious but not bulky, animal food in reasonable amount, milk, eggs, wheaten flour, oatmeal, beans, are all indicated. Rice is a bad food for beriberics, being too bulky (Mn); withdraw suspected food or drinking water (Ty). **Rest** in bed for the worst cases, especially those showing cardiac complications; the milder cases should be up and out in the open air. **Removal** from the infected house or district (Ty), is essential to recovery; a dry locality best, the room sunny, thoroughly ventilated and in an upper story (Mn). A sea-voyage has often a marvelously restorative effect (Id).

Biliousness.

Podophyllum acts as a cathartic (B); corrects deficient secretion of bile, especially in children and infants; gr. $\frac{1}{20}$ to $\frac{1}{10}$, every six hours, to correct white or clayey stools; also in general hepatic derangement (P). **Aconite,** in occasional doses, improves the effect of Podophyllum (R). **Mercurial Cathartics,** act only as purgatives; Calomel gr. j–x, or Pil. Hydrarg. gr. v–x; Mercury as purgative restricted to cases where there is excess or deficiency of bile (B); frequent small doses of gray powder for deficiency (R); Calomel, gr. iij, followed by ʒij each of Rochelle and Epsom Salts, when the tongue is heavily coated and furred (Gross). **Mercury, Yellow Oxide,** in doses of gr. $\frac{1}{60}$ to $\frac{1}{30}$, in trituration with sugar of milk, exceedingly efficient in many disordered conditions of the alimentary canal and its appendages (Schaffer). **Bryonia,** is worthy of commendation in the ordinary bilious headache with vomiting, and in the general hepatic derangement known as sluggish liver (P). **Hydrastis,** gtt. v–xv of fluid extract daily before meals, for biliousness with chronic gastric catarrh and dyspepsia (B). **Mineral Acids,** before meals, Hydrochloric Acid and Pepsin after meals, in atonic dyspepsia (B). **Stillingia,** when deficient biliary secretion (B); may be used in place of Mercury (Br). **Ammonium Iodide,** gr. j–iij in water each 2, 3 or 4 hours, for catarrh of duodenum and biliary ducts (B). **Ammonium Chloride,** is much employed in Germany for hepatic derangements, and with success. **Euonymus,** is considered a very efficient remedy by many practitioners in cases of hepatic dyspepsia, or "bilious attacks," so called. **Manganese,** for gouty subjects. **Rhubarb,** as a cholagogue. **Aloes,** in biliousness with constipation. **Angostura,** is suitable in the worst forms of bilious fevers (P). **Calumba,** is of benefit in many forms (P). **Alkalies,** and their laxative salts, in the bilious state, with uric acid diathesis (B). **Milk-cure,** in obstinate cases; buttermilk or skimmed milk often agrees best (B). [Compare DYSPEPSIA, HEPATIC CONGESTION, DUODENAL CATARRH.]

℞. Ext. Stillingiæ Fl., . . ʒv.
Tinct. Aloes, ... ʒij.
Tinct. Nucis Vom., . . ʒj.
M. Sig.—Twenty drops in water thrice daily. (B.)

℞. Ext. Euonymi, ... ʒss.
Ext. Hyoscyami, . . . gr. xv.
Ext. Gentianæ, ... gr. vj.
Fiat massa et div. in pil. xij. Sig.—One pill every other day.

℞. Hydrarg. Oxidi Flavi, . gr. j.
Sacch. Lactis, ... q. s.
Triturat. et div. in chart. xlviij.
Sig.—One powder dry on the tongue twice daily.

℞. Massæ Hydrargyri,
Ext. Colocynthidis Co., āā gr. iij.
M. et div. in pil. ij.
Sig.—Take at once, and follow it in a few hours with a saline cathartic.

Bladder, Irritable.

Belladonna, in nocturnal incontinence, due to relaxation of sphincter, or irritable mucous membrane (B); gtt. v–xx of tincture every 3 or 4 hours give gradual but sure relief (P). **Cantharis**, in women, without acute inflammation (B); incontinence on coughing (R). **Benzoic Acid**, when from enlarged prostate, removes fetor of urine; also renders phosphatic or alkaline urine acid (P). **Ammonium Benzoate**, may be used instead of Benzoic Acid (Br). **Gelsemium**, the best remedy for irritable bladder of women of hysterical type, with constant desire to urinate (B). **Cubeb**, is often successful in women, but Cantharis generally better (B); is of especial value when vesical catarrh present (P). **Aquapuncture**, strange to say, has been used with considerable success (B). **Cannabis Indica**, in spasm of the bladder and in irritable conditions of that organ, is generally useful. **Eucalyptol**, is often very efficient, but frequently fails, ♏ij on sugar two or three times a day. **Carbonic Acid**, by injection through a catheter, after washing out the bladder, may be employed in almost all forms of irritability of the bladder, unless acute inflammation be present (P). **Antipyrin**, 20 grains in solution, by rectal or vesical injection, powerfully lessens irritability of the bladder (Chastelet). [Compare CYSTITIS, DYSURIA, ENURESIS, LITHIASIS, CALCULI, URINARY DISORDERS.]

℞. Tinct. Gelsemii, ... ℨss.
Sodii Bromidi, ... ℥iij.
Ext. Triciti Fluidi, ... ℥iss.

Sig.—A teaspoonful in water every four hours, for irritable bladder.

Bladder, Paralysis of.

Cannabis Indica, in retention from spinal disease (R). **Ergot**, in paralytic dysuria, especially when sensation of bladder being only partially emptied (P); when incontinence from paralytic sphincter, and in paralysis from overdistention (Wa). **Arnica**, has proved curative (P). **Strychnine**, gr. $\frac{1}{40}$ to $\frac{1}{30}$, is useful (B). **Cantharis**, often given with excellent effect, when bladder atonic (Wa). **Galvanism**, may greatly benefit (B); electro-magnetic current from the bladder to the spine, of great use (Wa).

Blepharitis.

Pulsatilla, internally and externally (P). **Mercury**, after detaching crus[illegible], rub in brown citrine ointment (B); should be diluted with vaselin or sim[illegible]e ointment (Br). **Tannin**, powdered, or tannic acid solution, gr. j–x to the [illegible] ℥ (B). **Alum**, after acute symptoms subside (B); a solution, gr. viij to ℥j aq[illegible]e, every ¼ or ½ hour, an excellent application (R). **Hydrastis**, as lotion, v[illegible]ry serviceable (P). **Bismuth**, equal parts of the Subnitrate and Glycerin, to [illegible]he inflamed surface, in ciliary and glandular blepharitis (Wa). **Ergot**, the fl[illegible]id extract locally, gives excellent results (B).

℞. Aluminis, ... gr. x.
Aquæ Rosæ, ... ℥ij.
M. Sig.—Lotion for the eyelids. (B.)

℞. Unguent. Hydrarg. Nitrat., ℨj.
Petrolati Molli, ... ℨiij.
Sig.—Ointment for margins of lids.

Boils.

Chloral Hydrate, is probably the best local application; the boil should be kept covered with a tampon of cotton soaked in a solution of Chloral Hydr[illegible]ate ℨijss in Glycerin and Water, āā ℨv (Spehn). **Salicylic Acid**, locally, to dest[illegible]oy the staphylococcus pyogenes [see formula below]; a 2 per cent. solution in alcohol, washed over small boils, or in plaster of 50 per cent. strength, chan[illegible]ed 4 or 5 times daily, to hasten the necrotic process in a well-formed boil; a [illegible]½ per cent. ointment in vaselin rubbed over daily after bathing the part with warm water, in general furunculosis (Philipson). **Calcium Chloride**, in solution, externally as a fomentation, will hasten maturation; or Lime-water on compress covered with oiled silk, promotes suppuration more quickly than ordinary poultices (P). **Sulphides**, in small doses (gr. $\frac{1}{10}$ to ½ of Calx Sulphurata) every hour or two, or **Sulphurous Mineral Waters**, will abort or mature, and aid to expel pus (R); of no use in the boils of diabetes (R). **Belladonna**, as plaster, to subdue inflammation, or lint wetted with Atropine, gr. iv, Rose-water, ℥j (B); with Glycerin locally, to allay pain; internally often successful (R, Wa). **Aromatic Sulphuric Acid**, for the tendency, gtt. x–xv, in plenty of water thrice daily. **Silver Nitrate**, gr. v–xx to ℥j of Nitrous Ether, painted over adjacent part, to abort; specific if used early (R). **Boric Acid**, gr. xij daily, in 2 wafers; also a 4 per cent. aqueous solution warm, externally by gentle friction, 4 or 5 times a day, and on compresses to the parts—will abort furuncles yet in the commencement of development, rapidly cure those matured, and prevent new ones (Alison). **Arsenic**, long-continued for succession of boils (B); to lessen tendency to recurrence (Br). **Opium**, a thick extract locally (R). **Alcohol**, pure, or containing 5 per cent. of tincture of Benzoin, applied thrice daily to arrest minute boils (Philipson); Camphorated Alcohol, smeared over boils in early stage, then when the skin is dry smear with camphorated oil, to abort them (R). **Sodium Phosphate**, the best remedy for the systemic condition which produces boils (R). **Carbolic Acid**, undiluted, on a thread passed through center of boil while recent, will abort it; a Carbolic Acid solution (5 per cent.) on dressings after opening a boil, will prevent a second crop, due as is often the case to the migration of cocci into the skin from the original boil. **Counter-irritation**, by blisters or Iodine around the boil (R). **Collodion**, at papular or pustular stage (R). **Hydrarg. Biniodide**, the ointment locally, with Calcium Sulphide, gr. j daily in divided doses internally, leaves little to be desired so far as treatment is concerned. **Corrosive Sublimate**, the B. P. solution, 1 in 875, dropped into the ear twice daily, in furunculosis of the ear, also on cotton wool in the canal, gives satisfactory results and prevents return; as lotion, 1 in 1000, to frequently cleanse the part, then powder with Boric Acid and Starch, and cover with a clean and dry antiseptic dressing (Mn). **Iodine**, the tincture, locally to the initial papule, may often abort a threatening boil (Id). **Aluminum Acetate**, a solution in water (1 to 4) causes the speedy abortion of boils in the external auditory canal (Grosch). **Poultices** to assist maturation and allay pain, may be smeared over with Belladonna or Opium (R); should never be used, except in exceptional cases, as they sodden the adjacent area and are prone to be followed by more boils therein (Mn). **Mangos** are frequently blamed for boils in tropical countries. [Compare ACNE, CARBUNCLE.]

℞. Calcis Sulphurat., . . . gr. iij.
Sacch. Lactis, ... q. s.
Triturat. et div. in chartas xxx.
Sig.—One powder every 2 hours.

℞. Acidi Salicylici, ... ʒij.
Emplast. Saponat., . . ℥ij.
Emplast. Diachyl., . . ʒj.
Sig.—Ointment for boils. (*Heitzmann.*)

Bone Diseases.

Iodine, in scrofulous affections of bones, should be used locally, with Ferrous Iodide or Cod-liver Oil internally, nutritious diet, wine, out-door exercise (Wa). **Cod-liver Oil**, in scrofulous affections, may be relied on if perseveringly used and accompanied by good hygienic conditions (Wa). [Compare CARIES, EXOSTOSIS, NODES, PERIOSTITIS, RACHITIS, SPINA BIFIDA, etc.]

Breath, Fetid.

Potassium Permang., gr. j to ℥j aquæ rosæ, as a wash for the mouth (B). **Chlorine**, as solution of chlorinated lime to remove fetor (B). **Carbolic Acid**, a dilute solution, as wash for mouth (W). **Camphor**, is used as a corrective (R).

Thymol, in solution, as a mouth-wash is very efficient in removing the odor of tobacco from the breath. Look for bad teeth, disordered digestion, and in very offensive cases for gangrenous lungs; cleanliness of teeth is essential.

℞. Calcis Chlorat., . . . ʒiij.
Aquæ destillatæ,
Alcoholis, ... āā ʒij.
Olei Rosæ, ... ♏iv.
M. Sig.—A teaspoonful in a glassful of water as a lotion for the mouth. (B.)

℞. Acidi Salicylici, . . . ʒj.
Liq. Ammonii Acetatis, ℥iij.
Glycerini, ... ℥j.
Aquæ, . . . q. s. *ad* ℥vj.
M. Sig.—A tablespoonful every six hours. (*Robinson.*)

Bright's Disease, Acute.

Aconite, should be given immediately on the appearance of the nephritis in scarlatina (R); as a diuretic, advocated (P). **Strontium Lactate**, is highly efficient and is much more useful in acute nephritis than in chronic (Da C). **Pilocarpus**, is much used (Da C); large doses very depressant to the heart, but ♏v–x of the fluid extract every half-hour or hour will produce sweating; may be combined with tincture of Digitalis (Smith); or **Pilocarpine Nitrate**, to excite skin when symptoms urgent, gr. $\frac{1}{12}$ to $\frac{1}{8}$ for adult (B); the dose should be small at first; it is not a suitable drug for children (Y); I have latterly resumed its use, often with benefit (O). **Turpentine**, in drop or half-drop doses every 2 to 4 hours, controls the dropsy in a remarkable manner (P); hot turpentine epithems are serviceable but may increase the action of the kidneys (Wa). **Belladonna**, has often proved useful (P); may be used with benefit (Wa). **Hyoscyamus**, may be used instead of Belladonna (Wa); is useful in irritable kidneys (P). **Cantharis**, after subsidence of the acute stage, one-minim dose every 3 hours will stop the hematuria (R). **Digitalis**, (infusion ℥ss) the best remedy in renal dropsy from acute desquamative nephritis (B); is diuretic only as long as dropsy lasts (R). **Cannabis Indica**, as diuretic; is especially useful when bloody urine (R). **Eucalyptus**, sometimes effective; cautiously, or it will aggravate symptoms (B). **Jalap**, the compound powder is the most generally useful purgative, used in the early morning to produce free watery evacuations when uremic symptoms supervene (B). **Gallic Acid**, checks albuminuria (B). [See ALBUMINURIA, for formula.] **Juniper**, as diuretic; often aggravates (P). **Diuretics**, the stimulating ones, which act on the secreting cells of the kidneys, are contraindicated; but this is not the case with those which simply favor the flow of water through the kidneys, and of such diuretics **Water** is the best (Y). **Alkaline Salts**, as Potassium Citrate, Sodium Benzoate, or Sodium Bicarbonate, may be usefully added to the water (O). **Diluents**, as milk, and Potassium Bitartrate in solution, should be used freely to relieve the congestion and remove obstructions from the tubules (B). **Iron**, after the acute symptoms have subsided, as a tonic, the most suitable preparation being Basham's mixture (the now official Liquor Ferri et Ammonii Acetatis) in ℥ss doses thrice daily (Da C). **Poultices**, large, of linseed meal, made light and soft as possible, beneficial (Wa). **Cupping**, in lumbar region, ameliorates acute desquamative nephritis, and congestion of the kidney (B); cupping or leeches over the loins, with opiates freely, diluents, and demulcents, with rest and antiphlogistic regimen, often suffice (Wa). A **Vapor-bath** or **Warm Pack**, to increase the action of the skin. [Compare ALBUMINURIA, HEMATURIA, SCARLET FEVER, UREMIA.]

℞. Ext. Pilocarpi Fl., . . . ℥ss.
Vini Ipecac., ... ʒjss.
Mucil. Acaciæ, ... ℥j.
Aq. Cinnamomi, . . *ad* ℥ij.
M. Sig.—A teasp. every four hours until free diaphoresis.

℞. Pulv. Jalapæ Comp., . . ʒiv.
Div. in chartulas no. iv.
Sig.—One in water before breakfast.

℞. Potassii Acetatis, . . . ʒijss.
Infusi Digitalis, ... ℥iij.
Infusi Juniperi, . q. s. *ad* ℥vj.
M. Sig.—A tablesp. every 2 to 4 hours as a diuretic.

℞. Liq. Ferri et Ammonii
Acetatis (U. S. P.), . ℥viij.
Sig.—A tablesp. thrice daily, as soon as hematuria disappears.

Bronchitis, Acute.

Acetanilid, in dose of gr. iv every two hours, has often arrested the attack within 24 hours. **Aconite,** gtt. ss–j every hour (B); in catarrh and bronchitis of measles (R). **Tartar Emetic,** in the first stage, gr. $\frac{1}{20}$ to $\frac{1}{12}$, especially if cough is violent (B); gr. j to a quart of water, a teasp. of this every hour for the wheezing and cough of slight bronchitis in children (Smith); gr. ¼ to ½ every 2 or 3 hours (R). **Ipecacuanha,** as wine, when expectoration profuse and difficult to expel (R); in dry stage (P); **Ipecac,** when secretion is scanty and dry, but use **Squill** when the secretion, though copious, is difficult to expel (Br). **Lobelia,** as expectorant (B); for paroxysmal dyspnea (R). **Camphor,** in oil by hypodermic injection in bronchitis from cold; the first injection acts like an expectorant, and after the fourth the expectoration ceases completely, even in the most serious cases (Alexander); has but slight value in the bronchitis of the emphysematous. **Sanguinaria,** after subsidence of acute symptoms, as expectorant (B); very successful (P). **Quinine,** to reduce temperature (R). **Adrenal Extract,** has given good results [see page 165]. **Colchicum,** useful when gouty diathesis (P). **Opium,** Morphine and Quinine combined, or Dover's powder, to abort an attack; also with expectorants to allay cough (B); in frequent and violent coughs, without obstructed oxidation; also to check excessive secretion (R); as sudorific, gr. x of Dover's powder very useful (P). **Carbolic Acid,** as spray, a 5 per cent. solution with steam atomizer, prompt and efficient. **Apomorphine,** the Hydrochlorate internally in doses of gr. $\frac{1}{20}$ every three hours, the best of all expectorants. **Cimicifuga,** an excellent expectorant, and useful when acute symptoms have subsided (B). **Nitric Acid,** ♏x of the dilute acid relieves (B). **Asafœtida** or **Ammoniacum,** the last best, in bronchitis with wheezing of old people (R). **Asafœtida,** is an excellent stimulant of respiration, especially when the capillaries have become clogged with the products of inflammation, and suffocation seems imminent; here also the **Cold Bath** is a means of enabllng the patient to expel the mucus, the equal of which has not been yet advanced; it may be used for even very young infants, and should be but momentary for them (W). **Ammonium Carbonate,** when the expectoration is profuse, and the condition low (R). **Ammonium Acetate,** from its sudorific action, is always indicated, especially in children (Dessau). [See formula below.] **Cubeb,** very useful, especially when secretion copious and system relaxed (P). **Copaiba,** after subsidence of the fever, the most serviceable expectorant, but nauseous (B). **Counterirritants,** mustard as large poultice, with linseed or oatmeal, or both, very useful (R). **Iron, Lead, Zinc Oxide,** to check profuse secretion (R). **Heat** to chest by linseed poultices, of great service. **Diet,** should be light and in liquid form. **Temperature** of atmosphere in room should be about 80° F., and the air moistened by steam. [Compare COUGH.]

℞. Antim. et Potassii Tart., gr. ij.
Liq. Ammonii Acetatis, ℥iv.
Spt. Ætheris Nitrosi, . ℥j.
Tinct. Aconiti, ... ℥ss.
Syr. Simplicis, . q. s, *ad* ℥vj.
M. Sig.—A teaspoonful every 2 or 3 hours. In first stage.

℞. Liq. Ammon. Acetatis, ʒiv.
Spt. Ætheris Nitrosi,
Syr. Ipecac., ... āā ʒjss.
Syr. Senegæ, ... ℥j.
Syr. Limonis, ... ℥j.
M. Sig.—A teaspoonful every 3 hours for children. (*Dessau.*)

℞. Tinct. Sanguinariæ,
Tinct. Lobeliæ, ... āā ʒj.
Vini Ipecac., ... ʒij.
Syrupi Tolutani, q. s. *ad* ℥iv.
M. Sig.—A teaspoonful every 3 hours. (B.)

℞. Apomorph. Hydrochlor., gr. ¼.
Ac. Hydrochlor. Dil., . ♏iij.
Syrupi Senegæ, ... ℥v.
Aquæ Destillat., ... ℥j.
M. Sig.—A teaspoonful every 2 hours, for a child of 3 years as expectorant. Should be put up in a blue bottle.

℞. Ext. Cimicifugæ Fl., . . ℥ss.
Tinct. Opii Deodorat., . ʒj.
Syr. Tolutani, . q. s. *ad* ℥ij.
M. Sig.—A teaspoonful every 4 hours. (B.)

℞. Tinct. Aconiti, ... ♏viij.
Aquæ Cinnamomi, . . . ℥j.
M. Sig.—A teaspoonful every ½ hour for 2 hours, then every hour. In acute inflammatory form.

℞. Vini Ipecac., ... ʒij.
Liq. Potassii Citratis, . . ʒiv.
Tinct. Opii Camphorat.,
Syr. Acaciæ, ... aa ℥j.
M. Sig.—Tablesp. ter die. In first stage of ordinary acute bronchitis. (*Da Costa.*)

℞. Ext. Eriodyctii Fl., . . ʒvj.
Ext. Senegæ Fl., ... ℥iv.
Syr. Pruni Virginianæ, . ℥ij.
Aquæ, ... q. s. *ad* ℥iv.
M. Sig.—Teaspoonful every 3 hours.

Bronchitis, Capillary.

Ipecacuanha, as emetic, preferred to tartar emetic in capillary bronchitis of very young or very old (B); as wine, when expectoration profuse and difficult to expel (R); in very young infants should be used in place of antimony (M & P). **Squill**, as expectorant, may be used with benefit (Wa). **Antimony** Sulphurated gr. $\frac{1}{12}$ in combination with Dover's powder, every 2 or 3 hours, when the temperature very high, and pulse full and strong; must be stopped as soon as nausea and vomiting begin (M & P). **Lobelia**, for paroxysmal dyspnea (R). **Ammonium Carbonate**, when expectoration profuse and strength diminishing; in severe bronchitis or broncho-pneumonia of children, especially when prostrate and livid (R); has probably a specific action on the diseased tissue and its products (Clymer). **Ammonium Iodide**, in small, rapid doses, often gives great relief to the catarrhal process (Da C); often gives the most astonishing relief (B). **Ammonium Muriate**, gr. ij every 2 hours, either alone or with Potassium Chlorate (Clymer). **Serpentaria**, in capillary bronchitis of children gives excellent results (B). **Turpentine**, one of the best stimulants when vital powers are depressed and peripheral circulation feeble (B). **Camphor**, to allay cough and promote expectoration (B). **Hydrocyanic Acid**, for cough and tendency to spasm. **Hydrargyrum Subsulphate**, is effective as emetic (B). **Mustard**, as poultice or bath, useful (R); the most important part of the treatment (M & P). **Poultices**, to encircle the whole chest in children (R); followed by a jacket of cotton wool around the chest. **Steam**, by inhalation, may be impregnated with sedatives, or with Carbolic Acid; is of great importance (M & P). **Quinine**, in that form of capillary bronchitis occurring in tropical climates, and where marked debility (M & P). **Stimulants**, are often necessary, especially in the suffocative form, and where marked prostration (M & P). **Emetics** are necessary when suffocative symptoms become prominent. [Compare COUGH.]

℞. Ammonii Iodidi, ... ʒj–ij.
Ammonii Carbonat., . . ʒij–iij.
Syr. Glycyrrhizæ,
Syr. Tolutani, ... aa ℥ij.
M. Sig.—A teasp. every 2 or 3 hours.

℞. Quininæ Sulphatis, . . . gr. vj.
Ac. Sulphurici Dil., . . ♏xij.
Syr. Simplicis, ... ℥ss.
Aquæ, ... ℥ijss.
M. Sig.—A teasp. every 2 hours to child of 2 or 3 years; older children require more quinine. (M. & P.)

℞. Liq. Ammonii Acet., . . ℥ss.
Syr. Ipecac., ... ʒj.
Morphinæ Sulph., . . . gr. $\frac{1}{12}$.
Syr. Acaciæ, ... ℥j.
Aquæ, ... ℥jss.
M. Sig.—A teasp. every 2 hours for a child 2 years old. When surface pale and expression languid, skin cool. (M. & P.)

℞. Ext. Serpentariæ Fl., . . ℥ss.
Ammonii Carbonat., . . ʒij.
Syr. Tolutani, ... ℥jss.
A teasp. every 2, 3, or 4 hours.

Bronchitis, Chronic.

Antimony, when expectoration copious and difficult to expel (R). **Arsenic**, in cigarettes, when emphysema (B). [See ASTHMA, for formula.] **Sulphur**, gr. v–x, in severe cases, with abundant discharge, especially where constitutional debility (R). **Sulphurous Acid Gas**, inhalations, or the acid in form of spray, sometimes beneficial (R). **Hydrogen Dioxide**, the solution internally, doses of ʒj–iij, diluted with 3 to 4 of water, gives great relief in chronic bronchitis with dyspnea. **Lobelia**, for paroxysmal dyspnea (R). **Ammonium Chloride**, combined with stimulating expectorants, such as Serpentaria, Sanguinaria or Eucalyptus (B); when secretion is thick and abundant the salt may be applied by an atomizer (R). **Carbolic Acid**, as inhalation of spray, 1 part to 100 of water; may be combined with tincture of Iodine (R); a 5 per cent. solution in steam atomizer as inhalation. **Hydrastis**, fluid extract, locally and internally (B); of great value internally and externally in chronic coryza (P). **Senega**, especially in the aged (R). **Iodine**, by inhalation, sometimes used (R); the **Iodides**, especially Ammonium Iodide, are very serviceable in combination with expectorants (B). **Colchicum**, in gouty subjects (R). **Balsam of Peru** and of Tolu, when copious secretion of pus (R). **Ammonia**, as inhalation, to lessen expectoration (R). **Oleum Anthemidis**, in pulmonary catarrh with excessive secretion and difficult expectoration, a very useful remedy, ♏ij–iv (P). **Ammoniacum**, the mistura, with Ammonium Chloride or Carbonate, efficient in the bronchitis of old people, with wheezing and abundant secretion (R). **Benzoin**, ʒj of the compound tincture on boiling water, as inhalation; eases cough and lessens expectoration (R); is sometimes used by atomization (B). **Phosphates**, for the resulting cachexia (B); the Calcium Phosphate (R). **Serpentaria**, as stimulant. **Alum**, powdered, dusted over surface (B). **Silver Nitrate**, locally in solution, gr. v–xx to the ℥, on sponge probang (B). **Camphor**, to allay cough and promote expectoration (B). **Sumbul** has decided efficacy (P). **Opium**, with expectorants, to allay cough (B); when cough frequent and violent without any signs of obstructed oxidation, also to check excessive secretion (R). **Codeine**, gr. ⅙ every 3 to 6 hours, when other opiates are not well borne (P). **Morphine**, gr. ⅛ with 5 grains of Dover's powder at bed-time, followed by whiskey on the next morning, used in more than 200 cases of bronchitis with excellent results (English). **Euphorbia Pulifera**, is very successful in asthmatic, chronic and advanced or subacute bronchitis (Dujardin-Beaumetz); ʒss–j of the fluid extract thrice daily. **Ethyl Iodide**, by inhalation, is very valuable by reason of its local influence, ♏v–xx thrice daily (B). **Grindelia**, an excellent expectorant, especially when cough is troublesome (B). **Strychnine**, as a respiratory stimulant and to check the reflex vomiting (B); the Syrup of the Phosphates of Iron, Quinine, and Strychnine. **Squill**, in chronic forms with tenacious sputa, but not when fever or acute inflammation (R). **Adrenal Extract**, has given good results [see page 165]. **Tar**, diminishes the secretion and allays the cough (P); gr. ij in pill every 3 or 4 hours in chronic paroxysmal winter cough (R). **Digitalis**, when interstitial pneumonia and general anasarca (B). **Eucalyptus**, valuable in chronic cases of broncho-pulmonary catarrh (B). **Apomorphine**, by the mouth, as an expectorant, alone or along with morphine (Br). **Chekan**, a fluid extract of the leaves is said to be highly efficient (M). **Carbonic Acid**, diluted, may be inhaled with benefit (P). **Formalin**, in dilute solution administered as spray. **Nuclein**, has been administered with benefit, as a general tonic. **Gallic Acid**, is useful in some forms of chronic broncho-pulmonary catarrh (B). **Iron**, with free expectoration, Mistura Ferri Composita; or better, the Phosphate of Iron, Quinine, and Strychnine (B); to check profuse bronchial secretion (R). **Myrtol**, in fetid bronchitis, of great value (Gubler). **Copaiba**, when purulent secretion (R); for profuse secretion the best of all expectorants, but nauseous (B). **Cubeb**, when profuse expectoration, has similar remedial influence (B). [See BRONCHORRHEA, for formula.] **Terpin Hydrate**, gave immediate and curative re-

Bruises.

Arnica, the infusion very useful as an external application for bruises and cuts; also an excellent internal remedy for internal bruises, shake, falls, blows, or shock; ♏v–x every 2 or 3 hours (P); in bruises, sprains, etc. (Wa). **Aconite,** the liniment locally to painful sprains and bruises (Wa). **Capsicum,** a strong tincture applied with gum, said to act like a charm on discolored bruises (R). **Sulphurous Acid,** a solution constantly applied (R). **Oil of Bay,** as stimulating liniment (P). **Opium,** the tincture ʒj with Linimentum Saponis ℥j diligently rubbed in two or three times a day, affords great relief (Wa).

Bubo.

Mercury, necessary in the indurated buboes diagnostic of syphilis (Ricord); Calomel locally applied for indolent buboes refusing to heal after opening (H). **Nitric Acid,** indolent and broken bubo (R). **Sulphides,** are less useful in maturating buboes than in the case of ordinary boils or abscesses (R); to check suppuration (St). **Iodoform,** locally, has proved useful (Wa). **Iodine,** applied to produce vesication around a bubo, relieves inflammation (R); freely every day, with rest and compression, to cause absorption (St). **Silver Nitrate,** lightly to surface, to stimulate indolent buboes (Wa). **Potassio-tartrate of Iron,** 30 parts to 250 aquæ destil., three tablesp. daily, also as lotion to sore (Ricord); in phagedena (St). **Tartar Emetic,** gr. j every two hours, reduces inflammation in many cases (Wa). **Ice,** greatly relieves (B). **Surgical,** open freely with a bistoury when suppurating; if the pus is virulent the open bubo is a chancroid and must be treated as such (Keyes). **Pressure,** by compressed sponge under a spica bandage or a shot bag, the best local treatment for indolent bubo (Keyes); in all cases cleanliness, rest in recumbent posture, emollient poultices. **Diet,** should be generous with cod-liver oil in phagedenic bubo. **Treatment** of syphilitic bubo is that of general syphilis, local measures are useless and no treatment is called for until the general eruption appears (Keyes). [Compare CHANCROID, SYPHILIS.]

Bunion.

Iodine, as paint, or **Emplastrum Hydrargyri,** for indolent form, thick but not tender (D). **Rest,** fomentations and anti-arthritic remedies for thickened bunion; burst it by pressure if recent and sac thin (D). [Compare BURSITIS.]

Burns and Scalds.

Carbolic Acid, 1 part to 30 of Linim. Calcis, or 1 part to 6 of Olive Oil; the latter speedily relieves pain, and promotes healing without suppuration (Wa); 1 part to 10 of Olive Oil, applied on layers of cotton batting, the best application for burns of all degrees. **Boracic Acid,** a saturated watery solution, used with great success (Lister). **Lead Carbonate,** as white lead paint, an excellent application to burns of small extent (B). **Salicylic Acid,** ʒj to ℥viij Ol. Olivæ, is an efficient local application (B). **Collodion,** flexible, to burns of first degree (R). **Phytolacca,** relieves pain (B). **Lime,** as Lime-water and Oil, equal parts (R); or Lime-water with Linseed Oil, the celebrated *Carron Oil*, or better still with Olive Oil, a favorite and efficient application (P). **Picric Acid,** a saturated solution, Picric Acid 5, dissolved in Alcohol 80, then add Distilled Water 1000, applied on strips of sterilized gauze, gives better results than any other treatment (Power). **Normal Salt Solution,** applied on cotton, gives great satisfaction (Keen). **Aristol** j, Olive Oil, sterilized ij, Vaselin viij, as ointment for extensive burns (Walton). **Acetanilid,** powdered and dusted over the surface, is an excellent application. **Rhus Toxicodendron,** the tincture externally, ʒj to the pint of water, in superficial but extensive burns (P). **Cantharis,** the tincture diluted with 40 of water and applied on rags, is a most excellent application. **Sodium Carbonate** in solution as lotion, immediately relieves pain and promotes rapid healing. **Turpentine**, in dangerous cases, where great constitutional depression (P); as wash to severe burns, then locally Basilicon Ointment mixed with Turpentine (B). **Cotton-wool**, to allay pain and exclude air (P). **Warm Bath**, immerse for some days (R); exclusion of air the main indication (H). **Pinus Canadensis**, the concentrated extract, painted on freely, relieves the pain effectually.

Lime and Linseed.

℞. Olei Lini, ... ℥ vij.
Aquæ Calcis, ... ℥ viij.
M. Sig.—Apply on sheet lint, and cover with oiled silk.

℞. Sodii Carbonatis, ... ℥ vj.
Aquæ, ... Oiij.
M. Sig.—Apply freely for 3 days on old cloths or lint.

℞. Iodoformi, ... ℥ j.
Cetacei, ... ʒ j.
Ext. Conii Alcohol., . . . gr. xl.
Acidi Carbolici, ... gtt. x.
M. Sig.—Spread on lint and cover the parts therewith.

℞. Pulv. Carbonis Ligni, . . ℥ viij.
Sig.—To be dusted thickly over the burned parts.

Bursitis.

Iodine, painted on outside, after removal of fluid from aspirator (D); after blistering (Wa). **Blisters**, in rheumatic enlargement of bursæ, are almost indispensable for a rapid cure (Wa). **Fomentations**, with rest, to relieve pain and swelling; if unavailing, a crucial incision into the bursa, care being taken not to open the capsule of the knee (D). **Excision**, when chronic, tumor hard, resisting other measures (C).

Cachexiæ.

Calcium Phosphate, in scrofulous affections and anemia (Wa); in phthisis and affections marked by mal-nutrition (B). **Iron**, in splenic, syphilitic and strumous, and especially in all anemic states; also in the malarial and phthisical; chalybeate waters (B); the Ammonio-citrate is the best tonic in the cachexia of gastric ulcers, especially in chlorotic females (Wa). **Arsenic**, a prompt remedy in the malarial cachexia; also of real value in the cancerous (Wa). **Hydrastine**, in paludal and splenic cachexiæ, stands in high esteem (B). **Nitric Acid**, is adapted to the cachexia following acute diseases or intemperance; also as alterative after a long course of Mercury (Wa). **Potassium Iodide**, in constitutional syphilis and resulting affections of bones and skin (Wa). **Mercury**, in the syphilitic, but its utility much questioned (Wa). **Aurum**, in cancerous, mercurial, and syphilitic cachexiæ, especially when bones, glands, and oculo-nasal mucous membrane affected. **Phosphates**, in bone diseases, wasting, bronchitic, leucorrheic cachexiæ, etc. (B). **Arnica**, in very developed cachexiæ, has excitant action on the nervous system (Wa). **Eucalyptus**, a serviceable tonic and stimulant in cachectic states generally (B). **Manganese**, the Syrup of Ferrous and Manganese Iodide, in anemic, syphilitic, strumous, malarial, cancerous cachexiæ, etc. (B). **Grape-cure**, often modifies most happily many conditions (P). **Air**, in good condition, an important element (B). **Water**, the Turkish bath and wet pack as aids to remedial action, in plumbic, mercurial and paludal cachexiæ (B). **Oils and Fats**, to promote constructive metamorphosis in many cachexiæ, especially cod-liver oil (B); the latter a most valuable remedy in scrofula, phthisis, atrophy, tubercular and jail cachexiæ, anemia, etc. (Wa). **Massage**, has been productive of remarkable results in many forms of cachexia (B). **Aliment**, of prime importance (B). [Compare the titles ANEMIA, SCROFULA, SYPHILIS, etc., and the Formulæ for Tonics under ADYNAMIA AND ANEMIA.]

Calculi, Biliary.

Chloroform, in 20- to 60-drop doses every 3 or 4 hours, is by some supposed to act as a solvent of gall-stones; it cannot so act but undoubtedly affords some relief (B); as an inhalation it may be used to relieve the pain of the paroxysm (Br). **Ether and Turpentine,** equal parts of each, ʒj once daily for a year, is Durande's solvent remedy; is not solvent, and as an anodyne is inferior to morphine or chloral (B). **Morphine,** gr. $\frac{1}{4}$ with **Atropine,** gr. $\frac{1}{120}$, hypodermically, the best anodyne for the pain and vomiting during the paroxysm (Br). **Chloral** sometimes relieves the pain (R). **Counter-irritants,** as mustard poultices to relieve the pain during the paroxysm (Br). **Olive Oil,** ℥ij at night, followed next morning by 3 or 4 seidlitz powders an hour apart, efficient in facilitating the expulsion of accumulated gall-stones; this treatment is based on rational principles, as gall-stones placed in Olive Oil undergo solution, losing nearly 70 per cent. of their weight in 10 days (Brockbank); ℥iv–viij per diem between the attacks the best prophylactic (Id). **Sapo Animalis,** of the Br. Ph., is still more efficient for their solution and breaking up (Id). **Nitro-muriatic Acid,** as bath, found useful in India to relieve the pain and promote expulsion of the calculus, ℥iij of the acid to a gallon of water (Scott). **Glycerin,** is a good remedy for biliary lithiasis (Ferrand). **Sodium Phosphate,** in ʒ-dose before each meal for several months, to prevent recurrence (B); should be given in plenty of water (B). **Sodium Salicylate,** increases the secretion of bile and renders it more watery; it is therefore indicated in cases where there is a tendency to the formation of gall-stones (Br). **Succinate of the Peroxide of Iron,** hydrated, contains a large proportion of nascent oxygen, and is given in teaspoonful doses after meals for several months, and resumed at intervals afterwards to prevent reformation of the calculi (Buckler). **Diet,** is important; withhold all starches, sugars, and fats, also malt liquors and spirits; moderate exercise out of doors, lean meats, eggs, fish, fruits and succulent vegetables to be used freely. **Mineral Waters,** the alkaline are useful, especially Vichy, which is deemed of great benefit. [Compare COLIC, JAUNDICE.]

℞. Ferri Peroxidi Succinat.
Hydrat., ... ℥iss.
Aquæ, ... ℥vjss.
M. Sig.—Teasp. after each meal for several months.

℞. Spt. Ætheris Comp., . . ʒij.
Liq. Magendie, ... ♏xxx.
Syr. Zingiberis, q. s. *ad* ℥j.
M. Sig.—Teasp. doses, an hour apart, until pain is relieved.

Calculi, Renal and Vesical.

Alkalies, especially Potassium salts, if long continued, will effect solution of uric acid calculi (R); Sodium salts should not be used (B). **Calcium Carbonate,** an old and efficient remedy, also Lime-water has been used with benefit, and may be injected into the bladder (P). **Potassium Citrate,** in large doses for bloody urine containing uric acid crystals (R); the Citrate and Carbonate are the most desirable solvents for uric acid gravel (Sir H. Thompson). **Potassium Tartra-borate,** if long used, is very efficient as a solvent for uric acid calculi (B). **Potassium Salts,** are much more efficient than those of Lithium as solvents for uric acid (Rogers). **Alkaline Mineral Waters,** those rich in Potassium preferred, especially Vichy (B). **Ammonium Benzoate,** long continued, will dissolve phosphatic calculi (B). **Ammonium Biborate,** will prevent attacks of colic where uric acid calculi, in 20-grain doses every two hours until free urination, then gr. xv thrice daily in a glass of flaxseed tea. **Magnesium Borocitrate** is a good solvent of uric acid calculi (Madsen). **Lithium Citrate,** to promote oxidation (Da C). **Piperazin,** as a solvent for uric acid and urate concretions, is far superior to other agents. **Olive Oil,** internally, is of excellent service in renal as well as in hepatic calculi, controlling the crises of the disorder with undoubted effect (Aussilloux). **Hydrangea,** in decoction, used by the Cherokees in all calculous affections with uniform success (Butler). **Lead**

Acetate, gr. ½ to the ℥ of distilled water, injected into the bladder to prevent formation of phosphatic calculi, or a solution of **Dilute HCl Acid**, ♏ij–iij to the ℥ (Sir H. Thompson). **Nitric Acid**, very dilute, as injection for phosphatic calculi (R); gtt. j to the ℥, as injection into the bladder in chronic cystitis and phosphatic deposits (B). **Cotton-root**, in decoction, as a demulcent for strangury and gravel (P). **Castor Oil**, of value as a purgative (P). **Calumba**, to relieve the vomiting (P). **Counter-irritants**, as mustard-poultices, or turpentine stupes, to relieve the pain of the paroxysm (R). **Anesthetics**, for the same purpose (B). **Antipyrin** gr. xxiv, Laudanum gtt. x, Water ℥iij, injected into the rectum ¾ hour before beginning lithotrity, rendered the crushing and evacuation of the stone absolutely painless, the bladder seeming non-sensitive to touch or tension (Chastelet). **Morphine**, hypodermically, as an anodyne and to relieve the vomiting (B). **Hot Fomentations**, to alleviate spasm and pain while calculus is passing. **Diet**. Restrict the use of sugar in any form or combination, also fats and alcoholic beverages. Fresh, green vegetables may be used freely, also skimmed milk or buttermilk. Mineral waters, preferably Vichy, Friedrichshall and Carlsbad. Frequent abstinence from animal food. Lemon-juice and soft water in large draughts, are useful. **Surgical Measures**. Lithotomy or Lithotrity for removal of a stone from the bladder. Solvents are of no use except for a very small calculus, and even then a considerable time must be occupied in the process. No operation in surgery more certainly safe, rapid, and successful than lithotrity (Sir H. Thompson). [Compare COLIC, LITHIASIS, OXALURIA, etc.]

Magnesium Boro-citrate.

℞. Magnesii Carbonat., . ʒj.
Sodii Biborat.,
Acidi Citrici, . . . āā ʒij.
Aquæ Bullientis, . . ℥viij.
M. Sig.—Tablespoonful 3 or 4 times daily. (B.)

Potassium Tartra-borate.

℞. Potassii Bitartratis, . . . partes iv.
Ac. Borici, ... partem j.
Aquæ, ... partes x.
By heating the above together, the salt is obtained as a powder, of which gr. xx in a large draught of water 3 or 4 times daily.

Cancer.

Opium, stands first on the list of palliatives, allaying pain and quieting irritation (Wa); as powder applied to cancerous sores; also Morphine, dissolved in glycerin, and spread on lint, very useful where there is much pain; Opium is also used in cancer of the stomach (R). Codeine, gr. $\frac{1}{15}$ to $\frac{1}{10}$, a good hypnotic (P). **Arsenic**, in cancer of the stomach, diminishes pain and checks vomiting; also in scirrhus of stomach and epithelioma. Arsenous Acid, pure or with starch, as a caustic; enough should be used to set up active inflammation (R); may cause arsenical poisoning by absorption. **Belladonna**, locally and internally, ♏v–x, of great benefit as palliative in severe pains of cancer (P). **Conium**, as poultice, and internally to relieve pain (R); is particularly applicable to pain of cancer (P); as palliative (Wa). **Hydrastis**, has a renewed interest (Pf). **Carbolic Acid**, undiluted, to sore, and injected beneath it, limits and retards (B); pure, as anesthetic, before applying caustics; with glycerin as application to fetid cancers (R). **Mercuric Chloride**, in small doses, long continued, will retard the growth of gastric cancer (Da C). **Citric Acid**, ʒj to ℥viij aquæ, useful in allaying pain of cancerous ulcerations (Wa). **Acetic Acid**, 1 to 3 aquæ, ♏xxx injected into the tumor, has been used with varying success (Wa). **Chloral**, in 10-grain doses, 3 times a day, has relieved the most severe pain of cancer (R). **Chloroform**, as vapor to raw surface (R). **Pyoctanin** (Methyl Violet) in solution, by injection into the neoplasm, to bring about the shrivelling up and final disappearance of carcinoma (Mosetig). **Hyoscyamus**, bruised leaves, locally (P). **Bismuth**, relieves pain and vomiting of gastric cancer (B). **Aurum**, the Arsenate was extensively employed internally by Massart with benefit (see page 209). **Iodoform**, applied to diseased surface, relieves pain and removes fetid odor (P). **Resorcin**, 15 parts to 20 of Vaselin as an ointment twice daily after washing with a solution of Pot. Permanganate, has successfully stopped epithelioma (Antonio). **Potassium Chlorate**, in impalpable powder, dusted on epithelioma, said to be curative (B). **Pepsin**, injections into tumor (B). **Salicylic Acid**, pure, applied in powder (B). **Zinc Chloride**, the most efficient and safe escharotic; parts j–ij to v of flour, as "caustic arrows" inserted at base of tumor (B). **Potassa Fusa**, as escharotic (B). **Zinc Sulphate**, dusted over, dry, an excellent caustic; remove the eschar by poultice (B). **Bromine**, for destruction of uterine cancer, is preferred by some (B). **Chromic Acid**, a powerful escharotic (B). **Calcium Carbonate**, as calcined oyster-shell, very efficient in arresting growth of cancerous tumors, and in alleviating the pain thereof (Hood). **Rumex Acetosa**, an excellent local application; has a popular reputation. **Iron and Manganese**, the Syrup of the Iodide, for resulting cachectic state (B). **Toxins**, the erysipelas and prodigiosus toxins have proved more efficient in sarcoma than in carcinoma (Coley). **Ozone**, locally applied as an antiseptic and anodyne agent in cancer of the tongue and throat, is highly efficient; was used on Sir John Millais with great benefit during the last three months of his life and kept him comfortable without narcotics. **Poultices**, of starch, applied cold (R); or poultices of bread, sprinkled with charcoal or freshly ground coffee, as deodorizers to open cancers. **Water Enemata**, to relieve pain and straining in intestinal cancer (R). **Electrolysis**, has been of great service in many cases, relieving the pain and diminishing the tumor. In a case of sarcoma of the thigh, in which amputation was the only possible resource, after one application of the needles by Mr. Annandale, the pain was relieved and the tumor diminished (Duncan). It seems proved that there is a less frequent return of cancerous growths removed by electrolysis than by the ordinary procedures; the evidence in its favor has recently accumulated (Tibbits). In any case in which operative interference is necessary, electrolysis is the preferable method, and in others is advisable (Butler). In 18 cases of epithelioma treated by electrolysis, 13 were cured, 2 improved, in 2 there were no results, and 1 ended fatally (Groh). [Compare UTERINE CANCER.]

Cancrum Oris.

Arsenic, in medicinal doses (R). **Nitric Acid**, to surface (R); strong Nitric Acid the best caustic for worst forms of the disease (Wa). **Potassium Chlorate**, gr. xx–xl in 24 hours, has been strongly recommended (D). **Quinine**, made into a syrup, or as enema, to support the strength (Wa). [Compare APHTHÆ, STOMATITIS.]

Carbuncle.

Boric Acid, administered internally and externally as for Boils (which see); equally efficacious in carbuncle, diminishing pain, redness and hardness; numerous apertures rapidly form for the elimination of the core; the fever falls, excitation and insomnia abate, and the carbuncle heals, in the majority of cases without surgical interference (Alison). **Mercury**, Corrosive Sublimate, injected into tumor at several points, in doses of 2 drachms of a $\frac{1}{10}$ per cent. solution dividedly, has produced good results; these injections were often repeated, in broken doses likewise, on the following days (Casson). **Belladonna**, with Glycerin, as local application to relieve pain (P). **Ammonium Acetate**, to support the system (Cezard). **Carbolic Acid**, on lint, with Glycerin or Oil, into discharging sinuses (R); or hypodermically into the sloughing tissues. **Iodine**, to produce vesication around carbuncle; reduces inflammation (R); part j of the tincture to iij aquæ locally, has most striking effect (Wa); may be used with benefit internally or hypodermically (Cezard). **Calcium Sulphide**, gr. $\frac{1}{10}$ hourly or every two hours, of great service (R). **Opium**, a thick extract, locally (R). **Potassium Chlorate**, highly recommended, also **Quinine** and **Iron** freely, to support the system and counteract the carbuncular poison.

Poultices, the inflamed surface having been previously smeared with Belladonna and Glycerin (R); long-continued poulticing is thought to create a tendency to a fresh crop. **Strapping**, with plaster, concentrically from border inwards, leaving the centre free, will sometimes arrest extension (R). **Collodion**, as protective covering (P); as zone around base, leaving the centre exposed (Wa); Collodium cum Cantharide in a broad zone painted around the carbuncle, to relieve the tension (Ag). **Ice**, or **Ice-bags** or iced water on cloths in early stage, changing to warm fomentations as soon as suppuration has begun (Hebra). **Galbanum and Opium**, as plaster to relieve pain, the separation of the core then proceeding painlessly (Hill). **Crucial Incisions** are not so frequently made now as formerly; they relieve tension but often give rise to severe hemorrhage. **Diet** should be very supporting, and stimulants may be used freely when the patient is debilitated; Saline purges occasionally (Hill). **Cauterization**, with fuming Nitric or Carbolic Acid, on top of a free crucial incision, followed by dressing with Carbolized Oil, is the course to pursue in malignant pustule. **Caustic Potash**, applied before an opening occurs, or small pieces inserted into openings made by scalpel, to cause the rapid separation of the slough. The resulting ulcer should be treated on general principles. [Compare ANTHRAX, BOILS.]

℞. Calcis Sulphurat., . . . gr. iij.
Sacchari Lactis, . . . q. s.
Triturat. et div. in chart. xxx.
Sig.—One powder every 2 hours, to be taken dry on the tongue.

℞. Tinct. Ferri Chloridi, ʒj.
Potass. Chlorat., . . . ʒiij.
Liq. Ammonii Acetat., . ℥iij.
Syrupi et Aquæ, q. s. *ad* ℥viij.
M. Sig.—Dessertsp. every 2 hours.

Caries.

Aurum, in syphiloma of bones (B). **Calcium Chloride**, where strumous cachexia (B). **Phosphoric Acid**, with 8 parts water, locally applied, has been of benefit (Wa). **Phosphates**, the best is Syrup of Calcium Lacto-phosphate, or Parrish's phosphates (R). **Villate's Solution**, injected through the sinuses to dissolve the carious bone, has cured many cases (B). [See formula below.] **Sarsaparilla**, a very useful medicine (P). **Iodine**, locally, with Iron or Cod-liver Oil internally (Wa). [See BONE.] **Potassium Iodide**, in syphilitic caries, holds the first place (Wa). **Cod-liver Oil**, to promote constructive metamorphosis (R). **Mechanical Contrivances**, are necessary in most cases; Sayre's plaster jacket, Agnew's jacket of leather and steel, Taylor's apparatus, etc., are used in spinal caries to separate the diseased bones, and extend the spinal column. [Compare NECROSIS.]

℞. Cupri Sulphat.,
Zinci Sulphat., . . āā partes xv.
Liq. Plumbi Subacetat., p. xxx.
Aceti, ... p. cc.
(*Villate's Solution.*)

℞. Syrupi Calcii Lacto-phosphatis (U. S. P.), . . ℥viij.
Sig.—A dessertsp. to a tablespoonful 3 or 4 times daily.

Catalepsy.

Turpentine, in enemas, and embrocations along the spine, affords the best chance of stopping the paroxysms (Wa). **Treatment** must be essentially tonic and restorative (H); no constant line can be stated (A); external stimulation to arouse consciousness, by Ammonia, cold douches, Faradism, etc. **Apomorphine**, gr. $\frac{1}{20}$ to $\frac{1}{12}$, in the paroxysm; with the onset of nausea, consciousness returns and spasm ceases; in the intervals between the attacks the treatment should be that of hysteria (Gowers).

Cataract.

Galvanism, has been successfully employed in the incipient stage (Wa). **Mydriatics**, Atropine, Duboisine, etc., to secure full dilatation of pupil, as a means of ascertaining when the operation should be made, which is when the cataract is mature and there is no vision even with dilated pupil (Wa). **Diet and Regimen**, may do much to retard degeneration of the lens in cases due to diabetes, or to malassimilation in gouty or rheumatic persons (C). **Iridectomy**, made early and effectually may postpone the progress of lenticular opacity, if due to increased intraocular tension (C); in partial cataracts which have become stationary, iridectomy for artificial pupil may be done to expose the clear portion of the lens (Roosa). **Medicine**, accomplishes nothing except to improve the general health and so delay the progress of the opacity. **Removal** may be performed by one of several operations (Roosa). **Phosphorus, with Oil**, by frictions to the forehead, and instillation of the same into the eye, may cause absorption of the lens or capsule (Wa). **Codeine**, in diabetic cases (Br). **Sodium Sulphate**, a solution suggested as injection into anterior chamber, in hope to dissolve the nebula (Wa).

Catarrh, Acute Nasal.

Menthol, 1 or 2 parts dissolved in 20 of chloroform, of which a few drops in the hollow of the hand, the hands then rubbed together and placed before the face, the remedy being inhaled alternately through the nose and the mouth, will arrest the progress of a cold in its initial stages (Wunsche). **Chloroform**, by inhalation in small quantities, is an excellent nasal antiseptic, and is of great value in acute nasal catarrh. **Sodium Salicylate**, to abort a cold, gr. x bis die. **Aconite**, in severe coryza with much chilliness, aching limbs, hot and dry skin, and quick pulse; also in catarrhs of children and that accompanying measles (R); in acute coryza (P); with Belladonna in ordinary colds with sore throat and high fever (B); in doses of ♏⅓ every ¼ hour very useful for a commencing cold in the head (Smith). **Belladonna**, in acute nasal catarrh with profuse watery secretion, ♏v of tincture, then ♏j each hour (B). **Nux Vomica**, has great effect upon a dry cold in the head (P). **Euphrasia**, is of decided utility in coryza (P). **Pulsatilla**, a warm lotion, ʒj–ij in ℥iv aquæ, syringed into the nasal passages in subacute coryza with mucopurulent secretion (P); acts similarly to Aconite, but is contraindicated if much gastric or intestinal irritation exists (B). **Iodine**, by inhalation in daily attacks with itching nose (R); ʒij of the tincture with ʒj of Carbolic Acid inhaled from sponge in the bottom of a wide-mouthed bottle placed in hot water (B). **Iodides**, are unquestionably serviceable, their action being local and substitutive; Ammonium Iodide, gr. j every two hours, the best mode of using them (B). **Sodium Iodide**, gr. x ter die, with Pil. Ferri Iodidi in catarrhs of specific origin (B). **Potassium Iodide**, gr. x at bedtime at the onset, to cut short an acute cold in the head; also useful in chronic colds (R). **Arsenic Iodide** is very efficient as a remedy for an acute cold, coryza, and similar affections, especially when accompanied by a sore throat resembling that of diphtheria; gr. iij triturated with gr. xx of sugar of milk, one-half of which may be dissolved in ℥iv of water, and a teasp. given every hour or so. **Arsenic**, when sneezing, itching of nostrils and frontal headache (R); as cigarettes (B). [See under ASTHMA, for formula.] **Veratrum Viride**, if Arsenic fails (R). **Potassium Bichromate**, in small doses, gr. $\frac{1}{100}$ in trituration, is very efficient, especially when the nasal discharge is thick, stringy, and glutinous. **Potassium Chlorate**, in doses of eight or ten lozenges a day, will abort many a cold (R); a very good remedy in ordinary catarrh (P). **Quinine**, gr. x, with **Morphine**, gr. ⅙, at incipiency, will often abort an acute coryza (B). **Opium**, at night, if taken early in the case, will often abort an attack of coryza; a glass of hot grog assists its action (R); Dover's powder in a full dose at the onset may abort (B). **Codeine**, is useful in common colds, as a palliative (B). **Ammonia**, may be inhaled in the early stage (R). **Camphor**, as inhalation, the spirit in form of vapor (R); with Opium and Ammonium Carbonate as powder (see formula below), to break up or modify a cold (Beard). **Tartar Emetic**, gr. $\frac{1}{20}$ to $\frac{1}{12}$ in the first stage (B); in acute catarrh of children often accompanied by vomiting and diarrhea (R). **Ipecacuanha**, for acute nasal and bronchial catarrh, and ordinary colds in children (B). **Cimicifuga**, when headache, stiff muscles, dull aches, bone-pains, etc. (R); an excellent expectorant (B); rheumatic colds; neuralgic pains in jaw (P). **Jaborandi**, the fluid extract in doses of ♏x to xxx, every half hour until profuse diaphoresis sets in, is one of the best modes of aborting a cold; or **Pilocarpine Hydrochlorate**, gr. ⅙ in water at bed-time, will give prompt relief and cure in a few days (Wyss). **Cocaine**, a 4 or 5 per cent. solution locally as spray, to empty the engorged venous sinuses of the nasal mucous membrane by their contraction, which it induces; the fluid extract of Coca diluted with water is equally efficient if enough be used (Cohen). **Resorcin**, the best of all applications. [See CATARRH, CHRONIC.] **Chloral**, 20 grains in ℥j of Castor Oil, applied with a soft mop, when the Schneiderian membrane is very irritable, checks the secretion of mucus and lulls the irritation and the head pains (Brodnax). **Ammonium Chloride** or **Cubeb**, in the dry, congestive stage of a cold in the head; Cubeb cigarettes may be smoked as a temporary palliative with great relief. **Sulphurous Acid**, in coryza, by inhalation, spray, or fumigation, is very efficient (R). **Oil Inunctions**, daily to the whole body, in cases of undue susceptibility to taking cold, will prevent the frequency of the attack (B). **Baths**, a warm foot-bath before going to bed; Turkish bath, at onset in coryza, may prove abortive, also useful later on; cold sponge-bath in cases of extreme susceptibility, supplemented by occasional Turkish baths (R). [Compare COUGH, HAY-FEVER, INFLUENZA.]

℞. Quininæ Sulphatis, . . gr. xviij.
Liq. Arsenicalis (B. P.), ♏xij.
Liq. Atropinæ (B. P.), . ♏j.
Ext. Gentianæ, ... gr. xx.
Pulv. Acaciæ, ... q. s.
Ft. pil. no. xij. Sig.—One every 3, 4, or 6 hours, for acute colds. (*Whalen.*)

℞. Camphoræ, ... gr. l.
Ætheris, ... q. s.
Dissolve to creamy consistence, then add—
Ammonii Carbonat., . . gr. xl.
Pulv. Opii, ... gr. x.
Divide into thirty papers.
One or two powders, according to age, twice or thrice daily. (*Beard.*)

℞. Tinct. Aconiti, ... ♏x.
Tinct. Belladonnæ, . . ʒss.
Syrupi Zingiberis, . *ad* ℥ij.
M. Sig.—Half to one teasp. according to age, every hour.

℞. Acidi Carbolici, . . . gr. lxxx.
Alcoholis, ... ℥ss.
Aq. Ammoniæ, . . . ♏lxxx.
Aquæ, ... ʒijss.
M. Sig.—A few drops as an inhalation from a cone of blotting paper. (*Brand.*)

℞. Morph. Acetatis, . . . gr. iv.
Bism. Subnitrat.,
Pulv. Talci, ... aa ʒj.
Ft. chartulas no. xxx.
Sig.—Use as snuff in acute rhinitis. (*Sajous.*)

℞. Codeinæ, ... gr. ij.
Syrupi Tolutani,
Syr. Scillæ Comp., . aa ℥j.
M. Sig.—Teaspoonful occasionally for a common cold. (B.)

℞. Morph. Hydrochlor., . gr. ij.
Bismuthi Subnit., . . . ʒvj.
Pulv. Acaciæ, ... ʒij.
M. Sig.—Use as snuff, ¼ to ½ the above in 24 hours. (*Ferrier's Snuff.*)

Catarrh, Chronic Nasal.

Sanguinaria, the tincture in 10-drop doses thrice daily or gr. $\frac{1}{15}$ of the alkaloid internally, and the powder in small quantity locally to the mucous membrane, is successful treatment for chronic nasal catarrh (B). **Glycozone**, frequently applied, is of benefit (Edson). **Hydrastis**, is of value in chronic coryza, also in ulceration of the septum or any other part of the nasal fossæ, gtt. v of the tincture thrice daily internally, and ʒj to ℥viij of water locally by syringe (P). **Pulsatilla**, is excellent in subacute inflammation of nasal passages, with offensive muco-purulent discharge, ʒj–ij to ℥iv of water, as wash (P). **Potassium Bichromate**, is an excellent local application in a solution of gr. j–x to ℥iv water (B); small doses, gr. $\frac{1}{100}$ in trituration internally, a most efficient remedy, especially when the discharge is tough and stringy, and the nose tender. **Cocaine**, is much used, but is only of temporary benefit; danger of inducing the cocaine habit. **Resorcin**, the best of all applications; after cleansing the nose with Dobell's solution, use a 2 to 10 per cent. ointment in vaseline, also a spray every other day, of a 2 to 4 per cent. solution: it gives the same results as cocaine, but is slower in action and more lasting, and does not suppress the normal function of the mucous membrane, as the latter does. **Zinc Stearate**, makes an excellent insufflating powder, especially when mixed with boric acid, europhen, etc. [See page 530.] **Eucalyptus**, has been employed with benefit (Wa). **Bismuth**, in powder with acacia, as in Ferrier's snuff (see previous page), or with tannin, calomel, etc., used by insufflation daily (Robinson). **Iodoform and Tannin**, 1 of the former to 2 or 3 of the latter, carefully triturated and applied by an insufflator every other day only, is the very best of all applications (B). **Sodium Chloride** or **Phosphate**, a teasp. to the pint of warm water as cleansing solution, or the **Bicarbonate**, in the same proportion; a sea-water gargle in the naso-pharyngeal space, has been used with success (Mosler); Wei de Meyer's Catarrh Cure is simple Sodium Bicarbonate and a little pink coloring matter (Robinson). **Potassium Permanganate**, gr. j–x to the pint of warm water, as a deodorant solution when necessary. **Ammonia**, by inhalation, when painful inflammation of nasal mucous membrane and frontal bones (R). **Carbolic Acid**, a 1 per cent. solution as spray, or inhalations of the vapor with that of Iodine from a bottle in hot water, or vaporized by the warmth of the hand (B). **Salicylic Acid**, in weak solution, 1 to 500 of water, as a disinfectant and astringent injection, used with a retropharyngeal syringe, and followed by applications of powdered **Calomel** through a speculum upon the ulcerated parts of the mucous membrane (Massei). **Cubeb**, finely powdered and blown into the nares by an insufflator (B); may be smoked, and administered internally in teasp. doses (Wa); in freshly ground powder as a confection, in follicular disease of the naso-pharyngeal space (Robinson). **Ammoniacum**, in the same condition, small doses, gr. j–iij, with Ipecac or Ammonium Carbonate, will lessen the amount of secretion (Robinson). **Aurum Chloride**, in mercurialized and syphilitic subjects, with offensive discharge, depressed spirits, and soreness of the nasal bones. **Iodides**, of Iron and Sodium, in catarrh of specific origin (B). **Silver Nitrate**, in powder, as alterative application, gr. x–xv to the ℥ of menstruum, is often a useful adjunct to treatment, used once every 4 or 5 days (Robinson). **Cod-liver Oil** should be used in strumous subjects (R). **Alum**, in powder, dusted over the affected surface, is a useful application (B). **Bromine**, the vapor may greatly benefit, but must be used with caution (B). **Senega**, has been found serviceable (Wa). **Douche** is dangerous, being likely to cause extension of the catarrh to the Eustachian tube and the middle ear; it has been very generally abandoned. **Sprays** by hand-ball atomizers, or compressed air apparatus, of warm watery solutions, Vaselin, etc., are used with considerable success (Cohen); the Hank's atomizing tubes, with a 2-ball rubber syringe, are very serviceable for office use, and for the application of Rumbold's hot Vaselin spray. [See formula below.] **Sulphur Waters**, internally, of great benefit in follicular disease (Robinson). [Compare OZENA.]

℞. Acidi Carbolici, ... ♏x.
Glycerini, ... ʒvj.
Vaselini, ... ℥ij.
M. Sig.—Warm and use as a spray every 4 hours. (*Rumbold.*)

℞. Pulv. Argenti Nitrat., . gr. vij.
Pulv. Acaciæ, ... ʒj.
Bismuthi Subnitrat., . . ℥ij.
Triturat. Sig.—Apply with insufflator once in 4 or 5 days. (*Robinson.*)

℞. Acidi Carbolici, ... ♏xl.
Sodii Boratis,
Sodii Bicarbonat., . āā ʒij.
Glycerini, ... ℥vij.
Aquæ, . . . q. s. *ad* ℥viij.
M. Sig.—Use daily as spray.
(*Dobell.*)

℞. Bismuthi Subcarb.,
Pulv. Acaciæ, . . . āā ʒss.
Zinci Sulphat., ... gr. x.
Morph. Sulphat., . . . gr. ij.
M. Sig.—Snuff, to be used thrice daily.
(*Sajous.*)

℞. Bismuthi Subcarb., . . ʒvj.
Morph. Muriatis, . . . gr. ij.
Pulv. Amyli, ... ʒij.
Triturat. (*Burness' modification of Ferrier's Snuff.*)

℞. Ext. Pini Canaden., . . ♏xx.
Glycerini, ... ♏xxx.
Aquæ, ... q. s. *ad* Oj.
M. Sig.—Use with post-nasal syringe.

℞. Sodii Boro-benzoatis, . ℥j.
Ext. Hydrastis Fl., . . ℥j.
Glycerini, ... ʒj.
Ac. Carbolici, ... ♏xx.
Aquæ Camphoræ, . . . ℥vj.
Aquæ, ... q. s. *ad* ℥xij.
M. Sig.—Use with syringe or atomizer thrice daily. (*Chamberlain.*)

℞. Acidi Carbolici, ... gtt. xv.
Extr. Hydrastis Fl., . . ʒj.
Sodii Bicarb.,
Sodii Biborat., . . . āā ʒj.
Glycerini, ... ℥j.
Aquæ Camphoræ, q. s. *ad* ℥viij.
M. Sig.—Use with posterior nasal sprayer.

℞. Sodii Salicylatis, . . . ʒij.
Sodii Boratis, ... ʒiij.
Glycerini, ... ℥ss.
Aquæ, ... q. s. *ad* ℥vj.
M. Sig.—A dessertspoonful into a pint of warm water; snuff it from the hollow of the hand thrice daily. (*Sajous.*)

Cerebral Anemia.

Iron, the tincture of the Chloride, or mild chalybeate waters, in chronic cases from general anemia (B). **Amyl Nitrite**, in vaso-motor spasm; affords relief in sudden attacks (B). **Chloral**, in small doses with stimulants and warm baths (Ros). **Camphor**, or other cerebral excitants, as Asafœtida, Valerian, Serpentaria (B); the Mono-bromide in one- to five-grain doses (Hammond). **Glonoinum**, ♏j of a 1 per cent. solution (P). **Phosphorus**, supplies the needed material for healthy brain action (B). **Strychnine**, stimulates the circulation generally; with Iron preparations as a tonic. **Galvanism**, a mild current transversely through the head, gives excellent results in the confusion of mind, vertigo, etc., due to imperfect nutrition of the brain from atheroma of the cerebral vessels (B). **Arsenic**, is highly efficient in some hypochondriacal cases (B). **Aurum**, is of great utility in vertigo, melancholia, etc., when due to or accompanied by cerebral anemia (B). [Compare INSOMNIA.]

Cerebral Concussion.

Arnica, when concussion is due to a fall, cannot be too highly spoken of (P). **Warmth**, to extremities, rest, expectant treatment, will suffice in mild cases (Ag). The indications are: (1) to recover from insensibility and collapse; (2) to prevent inflammation; (3) to restore impaired faculties (D). **Stimulants** or **Venesection**, cannot be too strongly reprobated (Ag).

Cerebral Congestion.

Aconite, in the active form, renders important service (B); is much the best remedy in this condition (P). **Belladonna**, one of the best remedies in all hyperemic conditions of the brain or spinal cord (P). **Gelsemium**, ♏v of the luid extract every two hours, very useful (B). **Bromides**, are very useful (B); must be used in full doses. **Colocynth**, as a counter-irritant, appears to act well P). **Cathartics**, lessen blood-pressure (B). **Colchicum**, in plethoric subjects

(P). **Galvanism**, of the brain and cervical sympathetic (B). **Chloral**, when temperature high (B). **Arsenic**, sluggish venous circulation, torpor (B). **Hydrocyanic Acid**, ♏ij–v of Scheele's dilute acid (B). **Venesection**, will prevent injury to brain; not to be adopted as a matter of course; is contraindicated when anemia, aortic valvular disease, or in cases commencing with syncope (A). **Water**, cold douche to head, feet in warm water; ice and hot water alternately to head and nape of neck, often more effective than ice alone (B); hot water to head on flannels, mustard and hot water packing for 20 to 30 minutes around legs, when active congestion; protect bowels well (R). **Diet**, should be low, but not too low, until all fear of relapse is past; full animal diet should be avoided, also undiluted wines (A). [Compare APOPLEXY, COMA.]

Cerebral Softening.

Venesection, and antiphlogistic treatment generally, are most beneficial in red softening the result of inflammation; require wise discretion, and should be used early; not to be thought of in the yellow form, arising from want of nutrition, wherein restoratives and food are needed, perhaps wine (A). **Phosphorus**, in threatened softening of the brain; is the only drug which affects the nerve centers (W).

Chancre.

Mercury, small doses steadily, but ptyalism must not be induced; Black-wash (Calomel gr. viij, Aq. Calcis ℥j), or yellow-wash (Hydr. Chlor. Corr. gr. j, Aq. Calcis ℥j) on lint, to erosions and ulcerated indurations (B); Calomel alone as dry dressing: the internal use of Mercury is best postponed until secondary symptoms appear (St). **Carbolic Acid**, as wet dressing, gr. ij of crystals in ℥iv of water applied thrice daily (St). **Iodoform**, heads the list of dry dressings; with Lycopodium, equal parts, or 1 to 2 of Zinc Oxide; 2 to 1 of Calomel (St). **Hydrogen Dioxide**, said to destroy the specific character; wash lesions thrice daily, and apply lint soaked in it (R). **Caustics**, should never be used unless chancre is attacked by phagedena (St). **Caustic Alkalies**, to hard edges (R). **Bromine**, **Chromic Acid**, are the best escharotics (B). **Dressings**, are effective as far as the local trouble is concerned in the majority of cases, sometimes a piece of lint on the erosion will suffice; never cauterize an initial lesion unless it is attacked by phagedena (St). **Cleanliness**, of great importance; tepid water locally frequently suffices for the local treatment of infecting chancre. [Compare CHANCROID, SYPHILIS.]

Chancroid.

Mercury, the Acid Nitrate one of the best caustics; apply with a glass rod (B). **Nitric Acid**, fuming, as caustic (R); ʒj to ℥viij aquæ is an excellent dressing (St). **Carbolic Acid**, injected into sore (B); ʒij–v to Oj aquæ locally in phagedena (St). **Ferri et Potassii Tartras**, the born enemy of phagedena (Ricord); ℥j to ℥vj aquæ, internally, teasp. doses thrice daily; also locally (St). **Ferrous Iodide**, in sloughing phagedena, or simple chancroid in debilitated constitutions (B). **Iodoform**, powdered and dusted over the sore, allays pain, changes morbid action, and is antiseptic (R); 1 part to 2 of Lycopodium, or one of Tannic Acid; as stimulant and alterative (St); does no good except to relieve pain (Gross). **Potassium Chlorate**, in impalpable powder, is better than Iodoform (B). **Chloral**, gr. iij ad ℥j aquæ, the best local application to relieve pain (Gross). **Caustics**, in severe cases, the white-hot iron, strong Sulphuric Acid, pure Nitric Acid, pure Carbolic Acid, are effective in the order named (St). [Compare BUBO, CHANCRE.]

Chapped Hands and Lips.

Sulphurous Acid, as solution or by fumigation, will speedily cure (R). Glycerin, diluted, or better still, Glycerite of Starch, or with ½ the quantity of Eau de Cologne (R). **Benzoin**, the comp. tinct. 1 part to 4 of Glycerin; an admirable application (P). **Hydrastis**, on compress as lotion (P). **Collodion** is usefully employed (P). **Carbolic Acid**, 1 to 2 of Glycerin, locally; one application is generally sufficient. **Unguentum Aquæ Rosæ** alone, is often efficient; may be combined with Zinc Oxide. **Menthol**, with Salol, etc. (see below), is said to alleviate the pain of chapped hands on the first application.

℞. Mentholi, ... gr. xv.
Saloli, ... gr. xxx.
Ol. Olivæ, ... ʒ ss.
Lanolini, ... ℥ jss.
M. Ft. unguentum.

℞. Cetacei, ... ʒj.
Glycerini, ... ℥ij.
Ceræ Albæ, ... gr. xv.
Ol. Amygd. Amaræ, . . ♏iij.
M. Ft. unguentum.

Chest-pains.

Belladonna, as ointment, when tenderness is in the skin (R). **Iodine**, as oint. when pain is in muscles (myalgia) of chest, they being tender on pressure, while the skin may be pinched without pain (R). **Strychnine**, affords relief in functional irritability of the nervous system, manifested by wandering neuralgic pains (B). **Arnica**, internally for a stitch in the side. **Bryonia**, when painful catching of breath. **Cimicifuga**, for intercostal rheumatism and pains under the breasts in women. [Compare MYALGIA, NEURALGIA, PLEURITIS, PLEURODYNIA, PNEUMONIA.]

Chilblains.

Digitalis, internally and locally, to improve the circulation, and combat the arterial hypo-tension and peripheral vaso-dilatation which are always present in those subject to chilblains (Pilatte). **Caffeine** and **Kola** may sometimes be substituted for Digitalis. **Iodine**, as ointment, the best application (R); the tincture lightly painted over the surface every 3 or 4 days, is particularly serviceable for the itching. **Arnica**, is a useful application (Wa). **Carbolic Acid**, with Iodine, as ointment, is a very efficient application for chilblains. **Benzoin**, the tincture in Glycerin, applied after thorough washing in soap and water and drying, the best application. **Sulphurous Acid**, an efficient application; ʒj to ʒiij each of water and glycerin (B); as solution or fumigation (D). **Balsam of Peru**, in ointment for broken chilblains (R). **Capsicum**, the tincture painted over unbroken chilblains (R). **Cajuput Oil**, applied locally (R). **Turpentine**, as wash, then apply Basilicon Ointment mixed with Turpentine (B). **Ichthyol**, as oint. has been of service. **Thiol**, the dry form, as a dusting powder, is used efficiently. **Alcohol**, as Eau de Cologne, or camphorated, with friction, after careful drying of the hands and feet. **Vaselin** and other fatty substances should never be applied (Pilatte).

℞. Tinct. Digitalis, ... ʒjss.
Thymoli (cryst.), ... gr. xlv.
Alcoholis (70° C.),
Glycerini, ... āā ʒxv.
M. Sig.—For local use. (*Pilatte.*)

℞. Acidi Carbolici, ... ʒj.
Tinctura Iodi, ... ʒij.
Acidi Tannici, ... ʒj.
Cerati Simplicis, . . . ℥iv.
Misce bene, ft. unguentum. (*Morrow.*)

Chlorosis.

Iron, combined with Arsenic or Strychnine, also occasional purgation and active exercise (R); the Iodide, when much torpor of the system, is often speedily efficacious (Wa); Iron is not a specific in chlorosis, and acts best in the purest types (Tr). **Manganese**, the saccharated carbonate of iron and manganese (B); Pepto-mangan is a good preparation. **Arsenic**, if Iron fails or disagrees (B). **Aurum Arsenate**, has rendered good service. **Ergot**, in chlorotic amenorrhea (P). **Nux Vomica**, stimulates the blood-making organs, and may be combined with Iron; a very generally useful preparation is the syrup or elixir of Iron, Quinine, and Strychnine (B). **Cocculus Indicus**, when amenorrhea and exhausting leucorrhea (P). **Hypophosphites**, of Calcium or Sodium (R). **Benzoin**, has been used with advantage (P). **Pepsin**, benefits, especially where digestive derangement (B). **Sulphur**, of great benefit in cases where Iron is of no effect; also to prepare the system for benefit from Iron (Schulz). **Bone Marrow**, has been used with benefit. **Thymus Extract**, has apparently been of service. **Nuclein**, is employed with success in some cases. **Purgation**, is very important, to prevent auto-infection from putrid intestinal decomposition, which is the true cause of this disease (Duclos); absorption of such products tending to impoverish the blood, and produce a "fecal anemia" (Sir A. Clark). **Oils and Fats**, as inunctions, after baths, of great benefit (B). **Galvanization**, central, will aid the action of the remedies (B). [Compare ANEMIA, AMENORRHEA.]

℞. Ferri Arsenatis, ... gr. ij.
Extracti Cinchonæ, . . gr. xij.
Fiant pil. xij. Sig.—One pill after each meal. (B.)

℞. Ferri Sulph. Exsiccat., . gr. xl.
Quininæ Sulphatis, . . gr. xx.
Strychninæ Sulphat., . gr. ss.
Ft. pil. xx. Sig.—One thrice daily.

℞. Pulv. Aloes Socot., . . gr. v.
Ferri Sulph. Exsiccat., . gr. xv.
Ol. Tanaceti, *vel*
Ol. Sabinæ, ... gtt. xxx.
Croci,
Myrrhæ,
Cantharidis, ... āā gr. xxx.
Ft. pil. lx. Sig.—Two thrice daily, gradually increased to four. (*Wallace.*)

Choking.

Potassium Bromide, benefits a curious affection, sometimes found in children who from their birth can swallow solids with ease, but choke at drinks (B). **Oil of Cajuput**, in one case of persistent choking sensation in the throat, a few doses removed the symptom which had lasted several weeks (Hale).

Cholera Asiatica.

Camphor, a drop or two of the saturated tincture, or gtt. v–x of the spirit with a little Opium every half-hour (B); gtt. iv–vj of strong spirit every ten minutes until symptoms abate, then hourly (R); the combination of camphor, opium, etc., known as *Squibb's Cholera Mixture* (see next page for formula) is an efficient remedy at the inception. **Morphine**, gr. ⅙ to ½ hypodermically in the preliminary diarrhea (P); ⅛ to ¼ gr. of the greatest value even in collapse (R); dangerous if kidney complications exist (P): Morphine is the principal ingredient in *Chlorodyne* (see page 261), a remedy commonly used in India. **Chloroform**, a few drops frequently repeated, or 10 to 30 drops of chlorodyne, of great value (B). **Chloral**, with Morphine, by hypodermic injection, is the most effective treatment (see next page for formula); it causes pain and induration but not suppuration (B). **Arsenic**, in epidemic cholera; some cases of arsenic poisoning are not distinguishable from cholera (B); for the vomiting and in collapse (R). **Copper** salts have been given (R). **Turpentine**, ♏x–xx every two hours, promises to be a remedy of value (Wa). **Lead**, the Acetate in early stages (R). **Carbolic Acid**, with Iodine, has given good results (B). **Salol**, has done excellent service. **Sulphuric Acid**, the aromatic, with Opium, is very effective (B); two parts of the former with one of Laudanum, of this 5 to 30 drops as per age, is one of the best prophylactics (McClellan). **Strychnine**, as prophylactic during the preliminary diarrhea, and in epidemic form when nearing collapse (B). **Alcohol**, small doses of iced brandy for vomiting (B). **Spinal Ice-bag**, for cramps (R). **Saline Injections**, into the veins, have been successful in the collapse (B); Sodium Chloride, Sodium Carbonate, āā ʒj, Boiled Water quart j, makes a suitable injection, of which one to three quarts at 100° F. may be slowly injected into a vein by gravitation, the effect being carefully watched (Mn). **Milk**, by transfusion, in the collapse (B). **Irrigation** of the intestines with hot water and soap, using 1 to 3 gallons at a time twice daily, also Hydrogen Peroxide with hot water to cleanse the stomach; the method used by me in Russia and at Hamburg, during the epidemic of 1892 (Elmer Lee). **Treatment**, the only treatment of any proved value is the purely symptomatic and expectant one (Mn). **Absolute Rest**, recumbent posture, no food, ice *ad libitum;* enemata of warm milk; fresh air, friction, and heat to abdomen, legs and feet; stimulants are worse than useless. **Cholera Toxin, as inoculated by Dr. Haffkine, has been highly efficient as a prophylactic in India.**

℞. Chloroformi, ... ʒj.
Tinct. Opii,
Spt. Camphoræ,
Tinct. Capsici, . . . āā ʒiij.
Alcoholis, . . q. s. *ad* ℥ij.
M. Sig.—30 to 60 drops in water.
(*Squibb's Cholera Mixture.*)

℞. Acidi Carbolici, ... gr. viij.
Bismuthi Subnit., . . . ʒij.
Mucil. Acaciæ,
Aquæ Laurocerasi, āā ℥j.
M. Sig.—Teasp. every hour or two, for vomiting and diarrhea.

℞. Ol. Menthæ Piperitæ, . partem j.
Tinct. Opii, ... partes iv.
Ac. Hydrochlor. Dil., . partes ij.
Quininæ Hydrochlor., . partes iv.
Tinct. Cinchonæ Comp.,
Spt. Ætheris Comp., āā partes xv.
M. Sig.—15 drops every 2 hours.
(*Botkin's Cholera Drops.*)

℞. Chloralis Hydrat., . . ʒiij.
Morphinæ Sulph., . . gr. iv.
Aquæ Laurocerasi, . . ℥j.
M. Sig.—Fifteen to twenty drops as injection hypodermically.

Cholera Infantum.

Bismuth Subnitrate, in hourly doses of 3 to 6 grains, is regarded by many as almost a specific. **Ipecacuanha**, greenish stools with mucus and often blood (B). **Arsenic**, for vomiting and collapse (R). **Mercury**, gr. ⅙ of gray powder hourly of great service in infantile cholera with incessant sickness, profuse, almost continuous diarrhea, offensive and nearly colorless stools; a Starch injection, with a minute quantity of Laudanum, assists the gray powder, and should be given in urgent cases (R). **Zinc Oxide**, with Bismuth and Pepsin, is very useful (B). **Camphor**, ʒj of the spirit in ℥iv of milk, very serviceable (B); an admirable remedy for summer and choleraic diarrhea (R). **Opium** is generally necessary; enemata of Starch and Laudanum [see above under Mercury]. **Morphine**, hypodermically, in doses of gr. $\frac{1}{200}$ to $\frac{1}{30}$ according to age, the latter dose for a child of one year, with 5 or 6 drops of Ether, to be repeated in an hour, the most efficient treatment (E. Smith). **Copper Sulphate** is often very successful (B). **Carbolic Acid**, with Bismuth, may arrest the disorder promptly (Br). **Lead Acetate**, is one of the most useful astringents in this complaint (Br). **Potassium Bromide**, when due to nervous irritation or cerebral congestion (B). **Silver Nitrate**, is beneficial after the acute symptoms have passed (B). **Caffeine**, when due to nervous irritation (R). **Coto Bark**, the tinct. gtt. j–iij, is highly recommended by Rohrer for choleraic diarrhea in children. **Alcohol**, in grave cases, with tendency to collapse, gtt. x–xx of brandy with milk every 30 to 60 minutes. **Diet**, farinaceous food a common cause; cow's milk O¼ with sacch. lactis ℥j to O¼ aquæ-bul., or cold milk with Lime-water (R); milk, animal broths; no starches or fats (B). **Drinks**, as water, weak tea, etc., freely, to keep vessels filled and prevent paralysis of the heart (Meinert). **Spice Poultice**, to abdomen, composed of Cloves, Ginger and Cinnamon, mixed with brandy or whiskey. **Mustard Bath,** in stage of collapse, with mustard over the heart, and Ether hypodermically (Smith). **Lactic Acid,** a 2 per cent. solution in drachm doses, 5 to 8 times in 24 hours, in epidemic diarrhea of infants with green discharges, also local antisepsis as to linen and diapers, on the theory of a bacillary origin for the disease (Hayem). **Peptenzyme,** is excellent in cholera infantum and the summer diarrhea of children.

℞. Cupri Sulphat., ... gr. j.
Tinct. Opii Deod., . . gtt. viij.
Aquæ Destil., ... ℥ iv.
M. Sig.—Teasp. every 2, 3, or 4 hours for a child of one or two years. (B.)

℞. Acidi Carbolici, ... gr. xxiv.
Spt. Vini Gallici, . . . gtt. xxiv.
Aquæ Menth. Pip., . . ℥ jss.
Mucil. Acaciæ, ... ʒ vj.
Syr. Papaveris, ... ʒ vj.
Tinct. Opii Deod., . . gtt. x.
M. Sig.—A teasp. every 2 hours.

℞. Hydrarg. Chlor. Mitis, . gr. $\frac{1}{10}$.
Bismuthi Subnitrat., . . gr. ij–v.
In powder every half hour for the vomiting and purging.

℞. Acidi Carbolici, . . . gr. iv.
Bismuthi Subnit., . . . ʒ ij.
Mucil. Acaciæ, . . . ℥ j.
Aquæ Menth. Pip., . . ℥ iij.
M. Sig.—Teasp. every 2, 3, or 4 hours. (B.)

℞. Plumbi Acetat., ... gr. xxiv.
Pulv. Opii, ... gr. xij.
Pulv. Camphoræ, . . . ʒ ss.
Sacch. Lactis, ... q. s.
Triturat. et div. in chart. xij.
Sig.—One powder every hour. (B.)

℞. Hydrarg. Chlor. Mitis, . gr. $\frac{1}{2}$.
Plumb. Acetatis, . . . gr. $\frac{1}{3}$.
Pulv. Opii, ... gr. $\frac{1}{10}$–$\frac{1}{8}$.
Ft. pulv. no. j. Repeat every half-hour or hour for the acute gastric symptoms.

Cholera Simplex.

Camphor, an admirable remedy (R). **Salol,** is highly efficient. **Salophen,** is equally so. **Veratrum Album,** for the vomiting (R). **Copper Salts,** have been given (R). **Arsenic,** for vomiting; also for collapse in latter stages (R). **Chloral,** hypodermically with Morphine, is the most efficient treatment (B). [See C. ASIATICA for formula]; for the cramps Chloral ℥j in Linim. Saponis ℥iv to vj, applied to the abdomen with friction (Da C). **Opium,** gr. $\frac{1}{6}$ to $\frac{1}{2}$ every 2, 4, or 6 hours, in the early stage (P). **Morphine,** gr. $\frac{1}{8}$ to $\frac{1}{2}$ hypodermically, is very useful (B). **Carbolic Acid,** with Bismuth (see under CHOLERA INFANTUM for formula) is very effective (B). **Lead,** the Acetate in the early stages (R). **Calumba,** as anti-emetic, of great value (P). **Ipecacuanha,** has been used with much advantage (Wa). **Sumbul,** said to have proved successful (P). **Mustard,** as an emetic in collapse, to stimulate a failing heart (P). **Cajuput Oil,** much used in India for choleraic affections (P). **Alcohol,** as iced brandy in small doses for vomiting (B); the value of stimulants is justly doubted; if given, should be largely diluted (Wa). [Compare CHOLERA ASIATICA and INFANTUM.]

Chordee.

Aconite, gtt. j of the tincture hourly, will relieve chordee (R). **Belladonna,** combined with Camphor or Opium, gives the best results of remedies administered internally (St). **Camphor,** ʒj doses of the spirit will relieve (R). **Cantharis,** gtt. j of tinct. ter die, will prevent (R). **Cannabis Indica** or **Cannabis Sativa** (P). **Lupulin,** valuable (P); said to prevent (B). **Morphine,** hypodermically, the one sure remedy; should be injected into the perineum at bedtime (St). **Cocaine,** a few drops of a 4 per cent. solution, locally to the glans; or injected into the urethra, promptly relieves chordee. **Diet,** should be plain, even low, no stimulants; copious draughts of barley-water, or linseed tea.

iq. Morph. Magendie, ʒiv.
tropinæ Sulphat., . . gr. j.
cidi Acetici, ... q. s.
quæ Destillat., q. s. *ad* ℥j.
Sig.—♏v–viij hypodermically at
:. (*Sturgis.*)

℞. Pulv. Opii, ... gr. xij.
Pulv. Camphoræ, . . . gr. xxiv.
Sacch. Alb., ... q. s.
Fiant capsulæ xij.
Sig.—One at bedtime, to be repeated in 2 hours if required. (*Sturgis.*)

Chorea.

pyrin, is the only medicine from which cures may confidently be antici-
(McCall Anderson); is successfully used to combat excitability of the
nerve centres (W); may be given in 2 grain doses every 3 hours to very
children (Whitla). **Acetanilid** has been used with benefit, in both mild
ave forms of chorea (Id). **Exalgin**, with Citrate of Iron and Quinine
ieals (Dana); is believed by many to have specific power over chorea,
n doses of 2 grains thrice daily and gradually increased to 3 grains five
a day. **Arsenic,** is one of the most certain remedies, but large doses are
ed and are well borne (B); ♏iij of Fowler's solution thrice daily for a
of 7 years, gradually increased to ♏x thrice daily, and may be continued
veral weeks (Whitla); is very successful in uncomplicated cases (R).
ulphate, in doses of 2 or 3 grains gradually increased to 8 grains, is next
ie to arsenic (Whitla); in large and increasing doses is very useful (R);
tion similar to that of Arsenic, but is inferior (B). **Hyoscyamine,** $\frac{1}{200}$
hrice daily, gradually increased, has cured cases which resisted all other
ies (Da C). **Duboisine** is equally efficient; the Solanaceæ are very suit-
r nervous, delicate children. **Hyoscyamus** may be tried. **Quinine,** as
ulant to the inhibitory centre which controls motor discharge from the
cells, and which is weakened in chorea to a greater degree than the dis-
power (W). **Aurum Bromide,** in daily doses of gr. $\frac{1}{8}$ to $\frac{1}{6}$, continued
ts characteristic headache is produced (Goubert): the Bromides in full
have proved useful. **Chloral,** contributes to cure by inducing quiet sleep
n gradually increasing doses is of the greatest service, as it has an almost
te power to suspend or control spasm during its deep hypnotic action
ner). **Chloralamid,** may be pushed with greater safety, and excellent
have followed its use (Whitla); [see p. 260]. **Physostigma,** is recom-
ed (R); is of doubtful benefit (B); cures the disease in 5 or 6 days with
of $\frac{1}{10}$ grain of Physostigmine twice daily hypodermically (Reiss). **Calcium**
de, has done good in strumous subjects (B). **Cocaine,** is of the highest
and has cured cases repeatedly in which all the ordinary remedies had
sed in vain (B); the whole amount given daily has rarely exceeded ½
Id). **Cimicifuga,** is a very valuable remedy in cases due to menstrual
gement (P); when there is a rheumatic history (R). **Strychnine,** in doses
lly increasing to the toxic (Tr); minute doses, gr. $\frac{1}{80}$ to $\frac{1}{40}$, have been
useful when chorea is due to fright or commencing puberty (B). **Cuprum**
niatum, has been used successfully (B). **Iron,** large doses of the Subcar-
in anemic cases, about the time of puberty (B). Chalybeate waters often
or cure. Arsenic generally better, unless anemia coexists (R). **Vera-**
Viride, has been employed (R). **Cocculus,** or Picrotoxin, large doses (P).
n, in large doses, to quiet muscular agitation (B); is only palliative (R);
ce contradictory as to its value (P). **Valerian,** said to restrain the move-
(R); useful when from worms (P). **Chloroform,** inhalations often of
ervice in severe cases (R). **Morphine,** with Chloral, hypodermically in
doses for severe cases (Tr); when the movements prevent sleep (R).
has been given (R). **Cod-liver Oil,** when nutrition is low (R). **Water,**
d affusion to head and spine, and cold baths are important (B); tepid
first, cold should not be used if rheumatism or fever or pain in the joints
Electricity, static, is useful in some forms (B); the constant current used
cases, all recovering (Benedict); a galvanic chain around the neck and
the back, is reported serviceable.

℞. Chloralis Hydratis, . . ʒ iv.
Tinct. Hyoscyami, . . ℥ j.
Syr. Limonis, ... ℥ j.
Aquæ Cinnamomi, . . ℥ iv.
M. Sig.—A teasp. 3 or 4 times daily, according to age.

℞. Zinci Oxidi, ... gr. iij–vj.
Sacchari Albi, ... gr. lxxv.
M. et div. in pulv. no. vj.
Sig.—One powder thrice daily.
(*Bamberger.*)

℞. Tinct. Ferri Chloridi, . ʒ j.
Liq. Acidi Arsenosi, . . ʒ ij.
Syr. Limonis, ... ℥ jss.
Aquæ, ... q. s. *ad* ℥ viij.
M. Sig.—A teasp. thrice daily after meals, gradually increased and effects watched.

℞. Acidi Arsenosi, ... gr. $\frac{1}{30}$–$\frac{1}{15}$
Ferri Reducti, ... gr. j–iij.
Quininæ Sulph., . . . gr. ij–v.
In pill or capsule, thrice daily.
(*Sachs.*)

Choroiditis.

Mercury, as in iritis; cannot be borne to the same extent as in the latter disease (A). **Opiates,** necessary externally and internally to overcome pain (A). **Treatment,** is generally the same as in corresponding forms of iritis, but when atrophic spots appear on the choroid, no treatment can repair the damage (A); rest of eyes and protection from light by blue glasses; in suppurative form (panophthalmitis) use **Atropine,** in strong solution, with ice compresses and leeches in early stage; Paracentesis repeatedly to relieve tension and give exit to pus; Canthoplasty of outer canthus to relieve the pressure of the lids (Roosa).

Chyluria.

Thymol, in doses of 1 grain, gradually increased to 5 grains, cured two cases of chyluria due to filariæ in the blood (Laurie). **Hypophosphites,** the syrup in emulsion with Cod-liver Oil, caused the entire disappearance of chyluria in a woman who had been a life-long sufferer therefrom (Barnes). **Sodium Benzoate,** in doses of ʒj thrice daily, gave promising results, but the after-history of the cases was not obtained (Mackenzie). **Potassium Iodide,** in large doses, has checked the discharge for a time in several cases (Lewis). **Gallic Acid,** in doses of ʒj–ij, always affords some benefit (Id). **Ferric Chloride,** large doses of the tincture do some good (Id). **Treatment,** is unsatisfactory; no remedy appears to possess any constant effect (Whitla); drugs have no influence whatever in stopping the lymphorrhagia, the best results are obtained by absolute rest in bed, elevating the pelvis, restricting the amount of food and fluid—especially fatty food, and gentle purgation (Mn).

Climacteric Disorders.

Aconite, for nervous palpitations, and restlessness or "fidgets"; gtt. j hour (R). **Cimicifuga,** for distressing headache (R). **Amyl Nitrite,** in small os (I when the "heats" predominate, followed by cold, clammy, pale skin ur **Ergot,** for the flooding, gr. ij of Squibb's extract in fresh pill every hour relieved; Cannabis Indica may be well combined with it. **Cannabis Indi**ca used in the headaches of the menopause, with uniformly good results. [S HEADACHE, for formula.] **Iron,** for flutterings of the heart, with fullness head, heat and weight on the vertex, frequent flushings, and hot and cold p spirations; large doses of the Chloride thrice daily (R). **Nux Vomica, O**pium and **Belladonna,** when the symptoms described above under Iron are lim ite to the head and face (R). **Ammonia,** Raspail's sedative lotion to painful pa of the head in climacteric headaches (R). **Potassium Bromide,** for th despondency, with sleeplessness and irritability, often also with heats, fl ush ings, perspirations (R). **Physostigma,** the extract gr. $\frac{1}{50}$ every ½ hour f r 7 or 8 doses, for flatulence and a sensation of fluttering at the pit of the stom ach

(Smith). **Camphor**, for drowsiness and headache; Eau-de-cologne, saturated with Camphor, rubbed on the head (R). **Zinc Valerianate**, hysterical symptoms (R). **Change** of air and scene, when other treatment only partially successful (R). **Warm Bath**, to promote free perspiration; at 90° to 95° F. for an hour, once a week, will correct many of the symptoms (R). [Compare METRORRHAGIA.]

Coccygodynia.

Chloroform, injected as deeply as possible about the seat of greatest pain (B). **Electricity**, has cured one severe case of 12 years' standing, and helped others. **Surgical** treatment the only resource in rebellious and painful cases (Ros). Nott extirpated the coccyx; Simpson performed subcutaneous section of muscles and ligaments; Goodell removed the bone, after first treating the case as the local expression of a general neurosis.

Coldness.

Strychnine, for cold hands and feet (R). **Cold Baths**, with friction to the skin, nightly for cold feet (R). **Chloral**, in small doses daily, will counteract the coldness of the feet and hands in certain cases of anemia, hysteria, etc. (Cherchevsky). **Spinal Ice-bag**, is often efficiently employed in general coldness of the surface, and persistent coldness of the hands and feet (R). **Cocaine** or **Atropine**, will raise the body-temperature. (See page 38.)

Colic, Intestinal.

Nux Vomica, quickly subdues abdominal cramps and spasms (P). **Belladonna**, especially in children (R). **Chamomile Oil**, ♏iv–vj, in colicky attacks of hysterical women (P). **Cocculus**, of great value, especially during pregnancy (P). **Chloral**, sometimes relieves (R). **Chloroform**, effective in flatulent colic; also useful in hepatic and saturnine (B); often used combined with Opium (D). **Potassium Bromide**, in a peculiar form of colic in young children (R); given in Anise- or Peppermint-water is of greater efficacy for the colic of infants than the opium preparations in general use, and perfectly safe (B). **Asafœtida**, no better remedy in flatulent colic of infants; teasp. doses of the Emulsum Asafœtida (B). **Dioscorea**, is used successfully in so-called bilious colic, ♏xv–xxx of the fluid extract. **Morphine**, gr. ⅙–¼ hypodermically, repeated in 15 minutes, gives more relief than any other remedy in all forms of colic (B); frequent small doses (P). **Arsenic**, will cure in a surprising manner when enteralgia is idiopathic (B). **Essential Oils**, especially those of Cloves and Cinnamon (R); of Anise, Cardamom, etc.; Oil of Rue in flatulent colic of children (P). **Magnesium**, the Carbonate with Opium and Asafœtida, as in Dewees's Carminative (see page 202), the dose being ♏xx for an infant 2 to 4 weeks old. **Tobacco**, as enema, is dangerous! (B); as clyster, or by stomach (R). **Ammonia**, in spasm of intestinal canal and in colic of children or infants from bad feeding (R). **Lime Water**, for young children who eject milk in lumpy masses, with colic and flatulence (R). **Water**, hot fomentations to ease pain (R); a copious enema of warm water often gives immediate relief.

℞. Spiritus Chloroformi,
Tinct. Cardamomi Co., āā ℥ij.
M. Sig.—Teasp. in water every ½ hour. (B.)

℞. Atropinæ Sulphatis, . . . gr. j.
Zinci Sulphatis, ... gr. xxx.
Aquæ Destil., ... ℥j.
M. Sig.—3 to 5 drops two or three times daily.

℞. Ext. Gentianæ,
Pulv. Rhei, ... āā ʒj.
Ft. pil. xx. Sig.—One or two pills thrice daily for tendency to colic.

℞. Pulv. Camphoræ,
Pulv. Capsici,
Pulv. Zingiberis, . . . āā gr. ij.
Ft. pil. xij. Sig.—One pill as required.

Colic, Lead.

Alum, singularly, is the best remedy (B); gr. x hourly (R); converts the poisonous salt of lead in the system into a comparatively innocuous sulphate; ʒjss–iv daily with ♏xl–l Tinct. Opii, and an occasional dose of Castor or Croton Oil to procure one or two motions daily (Wa). **Opium**, gives more relief than any other remedy, gr. ⅙ to ¼ of Morphine hypodermically (B); gr. ij–iv of Opium, with a moderate dose of Castor Oil (P). **Sulphuric Acid**, diluted well, as a prophylactic, and is useful in the treatment of the disease (B); considered remarkably efficient when used in association with repeated Sulphur baths (Wa). **Calomel**, a full dose, with or without Opium, followed in a few hours by Castor Oil and a Turpentine enema, often affords speedy and marked relief (Wa). **Tobacco**, may control, but is dangerous (B). **Croton Oil**, in half-drop doses, with sufficient Opium to relieve the pain, repeated every 3 or 4 hours until free evacuations are produced; proves effectual when other remedies fail (Wa). **Magnesium Sulphate**, for the constipation, and to remove the poison from the system; should be combined with **Potassium Iodide**, ʒj of the former thrice daily and about two hours after having given gr. v–x of the Iodide; this treatment dissolves the lead in the tissues, causes its elimination by the intestinal mucus, renders it insoluble after it has entered the intestinal canal, and quickly removes it from the body (Br). **Atropine**, gr. $\frac{1}{100}$, with Potassium Iodide, gr. v, gives excellent results in the treatment of lead-poisoning, the former relieving the colic and pain in the head in the most rapid manner, keeping the bowels open freely, assisting in the return of the bodily powers, and aiding in the removal of the lead by the Iodide (Humphreys). [Compare POISONING BY LEAD.]

℞. Aluminis, ... ʒij.
Ac. Sulphurici Dil., . . ʒj.
Syr. Limonis, ... ℥j.
Aquæ, ... ℥iij.
M. Sig.—Tablesp. every hour or two for lead colic. (B.)

℞. Magnesii Sulphatis, . . ℥j.
Ac. Sulphurici Dil., . . ʒj.
Aquæ, ... ℥iv.
M. Sig.—Tablesp. every 3 hours (B); or thrice daily, each time preceded by a 5- to 10-grain dose of Potassium Iodide. (Br.)

Colic, Renal and Hepatic.

Ether, inhaled in paroxysms of hepatic colic (R). **Chloroform**, by inhalation in renal and biliary colic, inferior only to Morphine injection, superior to Opium, warm baths, etc.; two or three administrations will be required (R). [See also COLIC, INTESTINAL.] **Counter-irritation**, flying blisters for renal colic (R). **Opium**, small doses with Spt. Chloroformi every five or ten minutes until the pain gives way, or Morphine hypodermically (R). **Turpentine**, has been given with benefit in biliary colic (R). **Olive Oil**, in full dose during an attack of colic, frequently gives relief (Brockbank); stops the spasm of the ureters, and acts in nephritic colic precisely as it does in hepatic colic (Au[illegible]silloux). **Glycerin**, in doses of ʒv–vij in hepatic colic brings the attacks to an end; doses of ʒj–iv daily, in a little alkaline water, prevented recurrences (Ferrand). **Water**, warm baths to ease the pain (R). **Aliment**, withhold all starches and fats; Alkaline mineral waters are useful (B). [Compare CALCULI.]

Collapse.

Camphor, ʒj of a 10 per cent. solution in oil, hypodermically into each fore-arm, in the collapse of pneumonia (Schilling); hypodermic injections of camphor are used for purposes of excitation in collapse. **Ether**, by mouth, inhalation or hypodermically, is of great service. **Ammonia**, the liquor diluted by intravenous injection, in cases of fracture and laceration accompanied with collapse (P); in desperate cases when the hypodermic method is the only available route (Whitla). **Brandy**, or other alcoholic stimulant, by mouth if the patient can swallow, if not then by the bowel or hypodermically (Id). **Digitalis**, the tincture as a cardiac stimulant, but being slow of action it should be preceded by Ammonia or Alcohol. **Strychnine**, or **Nux Vomica**, for impending cardiac failure, is very efficient. [Compare the articles on HEART AFFECTIONS and SYNCOPE.] **Electricity** to the phrenic nerve, or an interrupted current through the upper extremities (Whitla). **Beef Extract**, Liebig's in large doses with hot water, is a rapidly acting stimulant (Id). **Transfusion**, or a warm saline solution by subcutaneous injection, when collapse is associated with extensive hemorrhage; or an Esmarch bandage to the limbs, or the tourniquet to the femoral artery, to keep the blood out of the lower extremities (Id). **Heat** to the surface and over the cardiac region. **Counter-irritation**, by mustard to the spine, nape of the neck, and calves of the legs. **Affusion**, of cold water alternating with hot (P). [Compare EXHAUSTION, SHOCK, SYNCOPE.]

Coma.

Croton Oil, as a purgative, ♏¼ or ⅓ every hour, mixed with a little butter or lard and conveyed to the back of the tongue (R). **Oxygen**, by inhalation, is generally applicable in coma. **Potassium Bitartrate**, free purging therewith, often removes coma, convulsions, and other symptoms due to poisoned blood (R). **Blisters**, in the comatose condition, large blisters or mustard poultices should be applied in quick succession to different parts of the body—chest, abdomen, thighs, and calves; often very valuable in the critical condition near the end of an acute illness (R). **Cold Douche**, for stupor of drunkenness or of opium poisoning; may have to be repeated if relapses occur; it should be kept up for a long time if pulse and breathing improve or are no worse (R). **Mustard**, as poultice to the feet and ankles in the coma of narcotic poisoning (P). **Exercise**, in coma from poisoning the patient should be persistently walked about. [Compare CEREBRAL CONGESTION, UREMIA, and POISONING BY NARCOTICS.]

Condylomata.

Nitric Acid, ℥j in Oj aquæ, as wash, frequently used (R). **Thuja**, locally a strong tincture, also ♏v internally, night and morning, for warts with narrow base and pendulous body; warts about anus or pudenda of either sex, whether syphilitic or not, are often rapidly cured by Thuja (P); in non-syphilitic warts of penis or vulva, I have employed it with satisfaction (Pf). **Mercury**, Calomel dusted over, after washing with a solution of Chlorinated Soda (Ricord); the Nitrate locally, or a 20 per cent. oleate (R). **Zinc**, the Chloride, Iodide or Nitrate as local applications (R). **Arsenous Acid**, as a caustic (R). **Carbolic Acid**, as a mild escharotic (B). **Chromic Acid**, gr. c in ℥j aquæ dest.; a good local application (B). [Compare SYPHILIS, WARTS.]

Conjunctivitis, Catarrhal.

Zinc, a weak solution of the sulphate or acetate as astringent collyrium (B); gr. j–ij in ℥j aquæ destil. as mild astringent lotion every few hours, with ice locally in the earlier stage (Roosa). **Sodium Borate**, gr. v in ℥j aquæ dest. a good and mild astringent for ordinary cases. **Boric Acid**, gr. vj in ℥j each of aquæ camph. and aq. destil., as collyrium (Fox). **Boro-glyceride**, in dilute solution, ʒss to the ℥, is an efficient application. **Mercury**, Calomel finely levigated and dusted from a camel's-hair brush over the palpebral conjunctiva in severe cases (B); is a most efficient application in the conjunctivitis of children showing minute ulcers; the Oleate of Mercury and Morphine applied to the outside of the lids in palpebral conjunctivitis (R); the Red Oxide as ointment, 10 grains to the ℥ of Vaselin (Bader); the Yellow Oxide, 8 to 10 grains to the ℥ of Vaselin (Seely); ½ grain in ʒij of Vaselin is strong enough. **Carbolic Acid**, a 5 per cent. solution applied every two hours by spray of steam atomizer, which dilutes it one-half, an extremely efficient application, relieving the pain and contracting the vessels. **Cocaine**, the Hydrochlorate, in 3 to 5 per cent. solution or oleate, applied to the palpebral conjunctiva, is a very efficient palliative, especially where much pain and photophobia (Koller). **Alum**, Potassa Alum after acute symptoms subside (Br); gr. iij–v ad ℥ij aq. destil. brushed over the conjunctiva twice daily. **Pulsatilla**, ʒj–ij of tincture to ℥iv aquæ, as wash several times daily, also ♏j–x internally every 3 or 4 hours (P). **Opium**, the wine dropped into the eye relieves pain and improves the condition of the conjunctiva (R); Morphine, gr. j–ij ad ℥j, is often used in collyria with Zinc Salts or Alum, but is irritant. **Cadmium**, as collyrium, gr. ij of the sulphate to ℥j aquæ rosæ (B). **Tannin**, in Glycerin, ʒj ad ℥j, every second day in chronic catarrhal conjunctivitis, presenting diffused injection of vessels with edema (Hansell). **Silver Nitrate**, solutions of gr. j–iv to the ℥, applied by physician to conjunctiva (R); should not be given to patient; Zinc and Copper Salts are preferred (B). **Copper**, the Sulphate crystal in chronic cases where great swelling or hypertrophy of the papillary layer; is too irritating to be entrusted to the patient. **Lead** salts should never be used lest deposits occur in slight abrasions or ulcerations of the cornea. **Sulphates**, of Zinc, Copper, and Iron, with Alum āā, gr. j to ℥j of aq. destil. as collyria, extremely efficient; in severe cases may be used in saturated solution by the physician (Holmes). **Castor Oil**, a drop placed in the eye often allays the pain and photophobia caused by an irritant (R). **Belladonna**, locally and internally (B). **Atropine** in strong solution, gr. iv to the ℥, is one of the best local applications where mydriasis is not objectionable. **Euphrasia**, as a mild astringent (P). **Blisters**, behind the ears in bad cases (R). **Ergot**, the fluid extract locally gives excellent results in acute conjunctivitis (B). **Staphisagria**, especially in tarsal ophthalmia (P). **Colchicum**, when gouty diathesis (A). **Spigelia**, in rheumatic form (P).

℞. Zinci Sulphatis,
Morphinæ Sulph., . āā . gr. j.
Atropinæ Sulph., . . . gr. ss.
Aquæ Rosæ, ... ℥j.
M. Sig.—Eye-water.

℞. Liq. Plumbi Subacetat., ʒj.
Aquæ Destillatæ, . . . ʒiij.
M. Sig.—For local use. To be brushed over conjunctiva of everted lids by the surgeon and washed off with water. (*Buller.*)

℞. Hydrarg. Oxidi Rub., . gr. x.
Atropinæ Sulph., . . . gr. j.
Vaselini, ... ℥j.
M. Sig.—A minute portion as an ointment for the eye. (*Bader.*)

℞. Ung. Hydrarg. Nitrat., . gr. xx.
Cocainæ Hydrochlorat., gr. v.
Vaselini Albi, ... ʒij.
Use a fresh ointment, triturate thoroughly, and label "Ointment for the eye."

Conjunctivitis, Diphtheritic.

Zinc Chloride, gr. ij–iv to the ℥, as collyrium, has succeeded admirably (Wa). **Atropine**, locally throughout the disease; not very effectual (Roosa); is, for severe cases, powerless; cornea sure to be attacked and liable to slough (Noyes). **Boric Acid**, a 4 per cent. solution, as antiseptic, the best application, with Quinine internally in full doses (Noyes). **Iron**, the Pyrophosphate for children, ʒj in ℥iij of simple syrup, of which a teasp. thrice daily after meals, with Quinine in 1- to 3-grain doses thrice daily and good food (Derby). **Cold** by compresses as in purulent ophthalmia, in early stages. **Silver Nitrate**, in 10 grains to the ℥ solution locally, or the mitigated stick in the second stage. **Tannin**, gr. xx to the ℥ of Glycerin, later on, applied every day, with hot water lotions if corneal complications are present.

Conjunctivitis, Gonorrheal.

Zinc Chloride, gr. j–ij ad ℥j aquæ, as collyrium, used with marked benefit (Wa). **Silver Nitrate,** a 2-grain to the ℥ solution, after syringing out the eye with warm water, followed by ice compresses, in hope to abort the attack, if seen early (Roosa). **Cold,** by ice or wet compresses, essential in the early stages (C). **Atropine,** may be used from the beginning, as corneal complications begin very early. **Treatment,** is generally the same as for Purulent Conjunctivitis; isolation and cleanliness are of prime importance.

Conjunctivitis, Granular.

Silver Nitrate, the diluted stick applied lightly and quickly (C); strong solutions to granular lids, gr. xx to the ℥ cautiously when corneal ulcers exist (B); mild solutions better, gr. v to the ℥ daily in the papillary form; in miliary trachoma it should not be stronger than gr. ij to the ℥ (Noyes); applications lose their effect after a time, and should be changed (Roosa). **Copper Sulphate,** the solid crystal lightly touched to the membrane once a day, the favorite astringent and caustic in all forms of trachoma (Roosa); when the membrane is torpid to other stimulation and when lymphoid substance is predominant; as ointment gr. v–x to the ℥ of Vaselin, when for use by patient (Noyes). **Alum,** a smooth crystal is a useful daily application (Noyes). **Tannin,** gr. x–xxx to the ℥ of Glycerin, an application to change to from others (Roosa). **Bismuth** is one of the numerous applications in chronic conjunctivitis and granular lids (B). **Phytolacca** internally, is undoubtedly efficient in granular conjunctivitis (W). **Jequirity,** to excite substitutive inflammation (see page 75). **Atropine,** gr. ij to the ℥, thrice daily, is often advisable, when moderate irritation and haziness of the cornea (Noyes). **Hygienic Measures,** are of great value; protection by blue or smoked glasses; rest of eyes, best secured by using Atropine collyria; hot or cold water as local bath frequently. **Tobacco,** must be avoided, also all locations contaminated by impure air. **Canthoplasty,** of outer commissure when the lids press on the globe.

Conjunctivitis, Phlyctenular.

Mercury, Calomel finely levigated and dusted from a camel's-hair pencil over the membrane in phlyctenular ophthalmia, an excellent application, but should never be used when Iodine is being taken; in more obstinate cases a small bit the size of a pin-head of Pagenstecker's ointment (Hydrarg. Oxidi Flav. gr. j–iij, Vaselini ʒj), placed between the lids (Noyes). **Ergot,** the fluid extract applied undiluted gives excellent results in the phlyctenular ophthalmia of children (B). **Antimony,** Tartar Emetic gr. $\frac{1}{48}$ to $\frac{1}{36}$ 3 or 4 times daily in strumous ophthalmia, with sharp purgation at the outset (R). **Belladonna,** or Atropine, locally in strumous ophthalmia, of great service in relieving pain; constitutional treatment also required (Wa). **Arsenic,** invaluable in inveterate cases of strumous ophthalmia, especially when complicated with cutaneous eruptions (Wa). **Tannin,** finely powdered and dusted over the everted lid, gives remarkably good results in this and other forms of conjunctivitis, causing very little pain and no inflammatory reaction (B). **Carbonic Acid Gas,** applied to the eye is said to relieve the pain and photophobia of strumous ophthalmia (R). **Hydrastis,** as lotion, is serviceable when Meibomian follicles are implicated, causing adhesion of lids in the morning (P). **Physostigmine,** locally, to reduce the pupil and shut out the light (P). **Iodine,** is employed locally in strumous ophthalmia, for its alterative stimulation (W). **Zinc Chloride,** gr. ij–iv to the ℥, as collyrium, has succeeded admirably in pustular ophthalmia (Wa). **Zinc Sulphate,** gr. j–iv to the ℥, is very serviceable; the addition of Liquor Plumbi improves its efficacy (Wa). **Rhubarb,** the Mistura Rhei et Sodæ when much disturbance of digestion present. **Tonics**, may be given later, as preparations of Cinchona and Iron. **Cod-liver Oil**, in strumous subjects, tends to remove the manifestations of the disease (R).

Conjunctivitis, Purulent.

Alum, gr. ij ad ℥j aquæ, a sufficient astringent application in ophthalmia neonatorum (Roosa); gr. viij ad ℥j aquæ, applied every ¼ or ½ hour in the purulent ophthalmia of children, its success depending on the frequency of the application (R). **Copper Sulphate**, gr. j ad ℥j aquæ camph. as collyrium in purulent ophthalmia of infants (Wa). **Silver Nitrate**, gr. iij–x ad ℥j aquæ destil., rarely so strong as gr. x to the ℥, applied by brush once daily to everted lids in purulent ophthalmia of infants (Noyes); solution gr. ¾ to the ℥ twice daily under lids (Meigs); by many considered needless and injurious (Roosa). **Boric Acid**, a 4 per cent. solution, as antiseptic, is all that is necessary in mild cases; in others it is the proper fluid for cleansing the eye (Noyes). **Atropine**, when the cornea becomes invaded and shows haziness, a solution gr. ij to the ℥ must be instilled every 3 hours (R). **Cold**, by ice or wet compresses, essential in the early stages of acute purulent ophthalmia (C). **Cleanliness**, of great importance; as the discharge is infectious the patient should be isolated and care taken to prevent inoculation of the other eye.

℞. Sodii Boratis, ... gr. xij.
Zinci Sulphatis, ... gr. j.
Aquæ Camph., ... ʒj.
Aquæ Destillat., ... ℥j.
M. Sig.—Apply to lids 2 or 3 times daily in ophthalmia neonatorum, with solution of Silver Nitrate, gr. ¾ to the ℥ injected under lids twice daily. (*Meigs.*)

℞. Sodii Boratis, ... gr. iij.
Aquæ Rosæ, Aquæ, āā ℥j.
M. Sig.—Apply beneath lids three or four times daily after cleansing.

℞. Atropinæ Sulph., . . . gr. j.
Glycerini, ʒss. Aquæ, ʒij.
M. Sig.—Two drops into the eye.

Constipation.

Nux Vomica, gtt. j–ij of tincture, twice or thrice daily (R); gtt. v–x in a glass of cold water before breakfast and dinner, often overcomes the most obstinate constipation (P); especially useful when great fecal accumulations from torpor of bowel (B). **Sulphur**, gr. x with Confectio Sennæ, often succeeds after other remedies fail (R); sulphurous mineral waters (B); or Sulphates in purgative waters; frequent small doses (R). **Podophyllum**, the most generally used cathartic when secretion deficient (B); gr. $\frac{1}{12}$ to $\frac{1}{8}$ night and morning when constipation with nervous and bilious headaches (P). **Senna**, as in the Pulvis Glycyrrhizæ Compos., which may be taken in doses of a teasp. to a tablespoon, as required, and kept up for months (Goodell). **Mercury**, Calomel or gray powder as a cathartic (R). **Hydrastis**, very valuable when constipation is referable to a sluggish liver (P). **Magnesium**, the Bicarbonate, a useful and mild aperient (R). **Alum**, a cheap and serviceable laxative (B). **Aloes**, in minute doses, in pill with **Ferrous Sulphate**, as the official Pil. Aloes et Ferri, is one of the best agents in the management of chronic cases; purgation should not be aimed at. **Chloral**, is an efficient laxative in rebellious chronic constipation, particularly that of neuropathic cases (De Holstein). **Ipecacuanha**, gr. j every morning, fasting, when great torpor of bowel (R). **Cocculus**, flatus, hard lumpy motions (P). **Turpentine**, in purely atonic constipation, with gaseous distention of colon, has triumphed when all other remedies failed (P). **Physostigma**, very effective in intestinal torpor (B). **Stillingia**, ♏x of fluid extract in habitual constipation (B). **Castor Oil**, a mild efficient cathartic (B). **Ammonium Chloride**, in the so-called bilious state with constipation (B). **Arsenic**, ♏ij of Fowler's solution often overcome constipation (R). **Belladonna**, gr. ½ of the extract at night, in habitual constipation (B); gr. ⅙–¼ once a day, especially when dyspepsia (R); acts directly on the bowels as a stimulant (P). **Croton Oil**, the most efficient cathartic, when simple impaction without inflammation; gtt. j–ij (B); when evacuations of blackened feces (R). **Cascara Sagrada**, the fluid extract in doses of ʒj, produces large, soft evacuations without griping, and leaves behind it a laxative influence. **Frangula**, in similar doses, is equally efficient, but if from a fresh bark may produce griping. **Cathartics**, especially Confectio Sennæ, Pil. Rhei Compos., Pil. Aloës, the Comp. Cathartic Pill, as well as those above (B); purgation as usually practiced was denounced by the editor of the *Lancet*, October 1, 1870. **Saline Waters**, are useful (B); Pullna, Friedrichschall, or Hunyadi, the first two with milk, are good for children (R). **Enemata**, of soap-suds and salt, or a pint of cold water (B); or Turpentine, Castor Oil, āā ℥ss to Oss–j of gruel (P); the habitual use of warm enemata increases topor of the bowels (R). **Tamar-Indien**, a favorite mild aperient, is proprietary, and supposed to contain Cocculus, Glauber's salt, etc. **Aliment**, important in habitual constipation; corn bread, cracked wheat, oatmeal, bread of unbolted flower, fruits, green corn, tomatoes and celery; ½ dozen each of almonds and raisins daily. **Water**, a glass of cold water before breakfast may overcome habitual constipation (B); drinking largely of water is a most beneficial measure in cases of chronic constipation. **Smoking** a cigar or a pipe after breakfast (R); tobacco smokers rarely suffer from constipation. [Compare INTESTINAL OBSTRUCTION.]

℞. Ext. Colocynth Co., . . gr. xij.
Ext. Belladonnæ, . . . gr. ij.
Ext. Gentianæ, ... gr. vj.
Olei Cari, ... gtt. iij.
Ft. pil. vj. Sig.—One pill at bedtime.

℞. Podophylli Resinæ, . . gr. ij.
Quininæ Sulphatis,
Ext. Aloes, . . . āā gr. viij.
Fellis Bovini, ... gr. xvj.
Ft. pil. no. xvj. Sig.—One or two at bedtime (*Goodell.*)

℞. Ext. Rhamn. Pursh., Fl., ℥j.
Ext. Belladonnæ Fl., . ʒj.
Tinct. Nucis Vom., . . ʒij.
Syrupi et Aquæ, . āā *ad* ℥iv.
M. Sig.—Teasp. thrice daily in obstinate constipation. (*Clarke.*)

Castor Oil Emulsion.

℞. Ol. Ricini,
Glycerini, ... āā ʒj.
Tinct. Aurantii, ... ♏xx.
Tinct. Senegæ, ... ♏v.
Aq. Cinnamomi, q. s. *ad* ℥ss.
M. ft. emulsum. Sig.—One dose, to be taken in the morning.

Artificial Hunyadi Water.

℞. Magnesii Sulphatis,
Sodii Sulphatis, . . āā ℥ss.
Potas. Sulphatis, . . . gr. ij.
Sodii Bicarbonatis, . . gr. viij.
Sodii Chloridi, ... gr. xx.
Aquæ, ... q. s. *ad* ℥viij.
M. Sig.—A winegl. before breakfast.

Convalescence.

Lime, as Lime-water, or the Carbonate, in convalescence from serious disease (R). **Quinine** or **Hydrastine**, to promote digestion and appetite (B). **Fats**, especially Cod-liver Oil (R). **Alcohol**, before or during meals (R). **Koumiss**, possesses great value (B). **Bitters**, especially Gentian and Calumba (B); the latter especially when stomach weak (R). **Eucalyptus**, a serviceable tonic (B). **Coca**, ʒss–ij of the fluid extract at a dose (B). **Guarana**, gr. xv–ʒj may be given (B). **Opium**, as Laudanum injected per rectum, for insomnia of convalescents (R). **Sea-baths**, valuable in many cases (R). **Nuclein**, is used with benefit. **Orchitic Extract**, has been employed with good results. **Bone Marrow**, gives great satisfaction in anemic cases. **Diet**, requires the most careful attention; the prevalent error of giving food difficult of digestion too early must be guarded against, especially in intestinal and gastric disorders; the strictest moderation should be enjoined. The symptoms must be watched closely, and combated by appropriate medication. [Compare ADYNAMIA for Tonic Prescriptions, also ANEMIA.]

Convulsions.

General Directions.—In all cases a horizontal posture, fresh air, clothing loose; a plug of soft wood or a cork between the teeth, to prevent biting the tongue; sprinkle the face and chest with cold water. **Epileptic.**—The general directions above will usually suffice. **Hysterical.**—The diagnostic peculiarities are: pupils not dilated but are sensitive to light, no wounding of tongue, face not livid, pulse usually normal. **Infantile.**—Administer some antispasmodic as Ether, alone or combined with Musk or Belladonna; then search for any mechanical cause, as a pin in a dress, etc.; lance the gums if dentition the cause (A). **Solanum Carolinense**, has a good reputation in the southern states for epilepsy and other convulsive affections, and has rendered excellent service in my hands (Napier); a tincture is prepared by bruising the berries and steeping them in whiskey, of which the dose is ʒj, repeated until drowsiness is produced. [Compare ALBUMINURIA, EPILEPSY, HYSTERIA, PUERPERAL CONVULSIONS, UREMIA.]

Convulsions, Infantile.

Belladonna is of the highest value in certain congestive forms, as in fits due to the irritation of teething, or those referable to whooping-cough (P). **Ignatia**, is efficient in convulsions of children from intestinal irritation, no cerebral congestion being present (P). **Valerian**, has been successfully used in convulsions from the worms to which it is fatal (P). **Potassium Bromide**, in all forms of convulsions in children (R); children bear it in large doses, gr. v thrice daily or oftener for a child a year old, in convulsions from teething (Br). **Chloral**, in large doses, gr. v, by mouth or rectum (Br); best used as a suppository rather than by liquid injection, and is often very useful (R); it gives better results than any other agent. **Chloroform** inhalations are of great service (R); useful in all forms (B); should be used to arrest the convulsion and prevent recurrence (Smith). **Alcohol**, has remarkable power in arresting convulsions of dentition; small doses of wine or brandy (W). **Asafœtida**, in the convulsions of teething, a small portion in an enema, appears to mitigate them (Wa). **Opium**, efficient but dangerous in young children. **Veratrum Viride** has been employed successfully (R). **Amyl Nitrite**, gtt. v, with gr. ¼ of Morphine, was used in one case as a last resort after five hours' convulsions in a child of 18 months, and resulted in producing quiet sleep (Engel). **Hot Baths**, are important, with cold affusions or ice to the head (B). **Spinal Ice-bag**, may be very efficient (R).

℞. Chloralis Hydratis, . . gr. v.
Lactis, ... ℥j.
M. Sig.—As rectal injection. Or the dose may be made into a suppository with cacao-butter and inserted well up into the rectum.

℞. Sodii Bromidi,
Chloralis Hydratis,
Sodii Bicarb., ... āā gr. viij.
Aquæ, ... ℥j.
M. Sig.—A teaspoonful every hour to a child under four months old.

Corneal Opacities.

Cadmium, is said to promote their absorption; gr. ij of the Sulphate to ℥j of rose-water, as collyrium (R, Wa). **Mercury**, Calomel by insufflation, or the red Iodide gr. ij, Cerate gr. xl, Olive Oil gtt. xx, as ointment, successfully used (Wa); weak solutions of the Bichloride, or ointments of the Oxides, gr. ¼ to the ℥, as remedies among others to hasten absorption in recent cases (Arlt). **Oils**, Eel-liver and Cod-liver Oils, Ox-gall, Juniper Oil, Oil of Turpentine combined with Olive Oil, and others, dropped into the eye once or twice daily for the same purpose (Arlt). **Opium**, the wine at first, then insufflations of Calomel and Red Precipitate or Yellow Oxide ointment, frequently used in recent cases (Arlt). **Potassium Iodide,** as ointment with Potassium Carbonate after Cod-liver Oil or Oil of Turpentine with Olive Oil, in cases of longer standing (Arlt). **Silver Nitrate,** gr. v–x ad ℥j aquæ, as lotion (C). **Iodine,** internally and as collyria, has been efficacious, especially in strumous cases (Wa). **Sodium Chloride,** gr. x ad ℥j aquæ destil., of which ♏v–x injected subconjunctivally, to hasten disappearance of turbidity (C). **Operative Measures,** only in case of incrustations (as of lead and lime) situated superficially, by removal of epithelium and anterior elastic layer; deeper interference may lead to suppurative keratitis. Excision of opaque cornea and transplanting of one from an animal's or a recently enucleated human eye (keratoplasty), has always failed. Artificial pupil by iridectomy, for central opacities which are unremovable. Tattooing to relieve deformity of disfiguring leucomata (Arlt). Pannus and leucoma are best let alone (D). **Stenopaic Spectacles,** for semi-transparent opacities in pupillary region (Donders). [Compare KERATITIS.]

Corns.

Salicylic Acid, in strong solution, removes excess of epidermis, warts and corns; is the essential ingredient of all corn-cures. **Silver Nitrate,** solid, after soaking and paring (Wa); the best application for soft corns and very irritable ones (D). **Acetic Acid,** strong, to remove corns (Wa). **Mercury,** Corrosive Sublimate in alcoholic solution locally to remove corns (Wa). **Iodine,** gr. xl ad ℥j Alcoholis, locally (Wa). **Poultices,** are useful; or a plaster of soft material with hole in centre (D). **Water,** hot and cold, alternately applied to inflamed corns. Keep a corn thin by frequent washing and paring; in performing the latter the knife should work downwards to the apex of the corn, so as to remove the central pressure on the subjacent tissue.

℞. Acidi Salicylici, . . . gr. xv.
Extr. Cannabis Ind., . gr. vijss.
Alcoholis, 90°, ... ♏xv.
Ætheris, 62°, ... ♏xxxvij.
Collodii Flexilis, . . . ♏lxxv.

Mix, and keep in closely-corked vial. Paint the corn every other day for a week, then it can be easily squeezed out.

(*Vigier.*)

Cough.

Opium, in some form, is much used in cough-mixtures; Morphine and Glycerin applied to fauces (B); moderate doses are useful in irritative affections of the air-passages to allay irritation and hypersecretion, but it may do even fatal mischief in cases where secretion is copious and expulsory power feeble (P); opiates inadmissible when with copious expectoration there is any indication of bronchial congestion (Wa); very useful in violent and frequent cough with little rhonchus and no signs of obstructed oxidation; also, when cough is due to red, inflamed and ulcerated throat; Opium or Morphine given so as to cling for some time in contact with the pharyngeal structures (R). **Codeine,** is often efficient in cough (Br); of particular value in ¾-gr. doses; is slightly expectorant, also laxative, does not nauseate or cause vomiting, or affect the appetite; is by far the best agent for the cough of phthisis when morphine is not well borne (Kobler). **Peronine** is intermediate in its effects between morphine and codeine, and has a very quieting action on the paroxysmal cough of phthisis (Schröder); gr. ⅓–⅝ thrice daily, the latter dose giving a quiet night's sleep, even in cases where morphine and codeine were ineffective (Munk). **Heroine and Dionine,** are very useful [see page 399.] **Nux Vomica,** in laryngeal cough of neurotic origin, drop doses of the tincture every five minutes; is promptly efficient (Macfarlan); has specific action on the pneumogastric, and is one of the most efficient remedies in cough of any kind, whether from bronchitis, pneumonia, phthisis or emphysema, but especially in nervous coughs and periodic coughs which come on in the evening and stay all night

(*Jour. de Méd.*). **Pulsatilla**, as Anemonine, ½ gr. and gr. doses, very useful in irritative cough, asthma, whooping-cough (P). **Iodine**, by inhalation for children in hoarse, hollow cough, wheezing (R); the tincture, 5–10 drops, inhaled from boiling water for five minutes at bedtime, often gives most signal relief in the irritating cough of phthisis. **Apomorphine Hydrochlorate**, very valuable in cough where there is persistent hacking without expectoration, or with difficult expectoration; the dose is only gr. $\frac{1}{20}$ to $\frac{1}{16}$ in the 24 hours; solution rapidly alters unless a few drops of Hydrochloric Acid are added (Stocquardt). **Terpin Hydrate**, in bronchial cough, and night-cough from habit, is very efficient in a 2-grain dose at bedtime, repeated early in the morning (Boyland). [See under BRONCHITIS, CHRONIC, for formula.] **Aconite**, irritable, tickling throat-cough; short, dry cough of asthmatics, with anxious look and full, strong pulse (P). **Belladonna**, often useful; no indications (R); internally and externally as plaster to the chest, very serviceable in spasmodic and nervous coughs (Wa). **Hyoscyamus**, very useful in spasmodic tickling night coughs (P).

Hydrocyanic Acid, for nervous, irritable cough and cough of phthisis, also mother's sympathetic cough (B); no more certain palliative for simple, nervous cough due to irritable state of the system (S); a valuable adjunct to ordinary remedies in cough of phthisis (Wa). **Potassium Cyanide**, is equally useful, gr. iij with ℥j each of Ext. Grindeliæ Fl., Syr. Scillæ and Syr. Tolutan., makes a good non-opiate cough mixture, of which the dose is ʒj every 4 hours (Waugh). **Prunus Virginiana**, has some influence, due to its Hydrocyanic Acid; is much used in cough mixtures (P). **Laurocerasus**, used as a substitute for Hydrocyanic Acid in spasmodic coughs (B). **Conium**, supposed to be useful (R); is very useful in spasmodic cough (Wa). **Ipecacuanha**, the fld. extr. for troublesome night-cough (B); in obstinate winter-cough, with wheezing, the wine as spray to fauces, efficacious (R); in coughs of childhood Ipecac is one of the most generally serviceable expectorants we can use (Wa). **Lobelia**, dry cough, continued tickling sensation, even in sleep (P). **Sanguinaria**, combined with Hyoscyamus, in nervous, spasmodic cough (P). **Senega**, as a stimulant expectorant in the cough of chronic bronchitis and subacute chest affections. **Gelsemium**, excessive irritability of the respiratory centre (R); often remarkably relieves convulsive or spasmodic, reflex and nervous coughs (B). **Alum**, internally in spasmodic cough; gr. x to ℥j aquæ as spray, in chronic cough also (R). **Drosera**, the fluid extr. in ½ teasp. dose t an adult every 2 or 3 hours, of high value when spasm predominates. [Se page 306.] **Potassium Bromide**, serviceable in various reflex coughs (uterin renal, etc.), and in cough of phthisis it is occasionally ameliorative as a garg (B). **Cubeb**, ʒss–j of the tinct. in half-glass of Linseed tea thrice daily, ofte cures like a charm the coughs of chronic catarrh, of emphysema, or acu catarrh, or following an attack of influenza (R). **Asafœtida**, its value due the sulphur in it (Garrod); very serviceable in after-cough from habit, and mother's sympathetic whooping-cough (B). **Carbolic Acid**, as spray, a 5 p cent. solution in a steam atomizer will often prevent as well as cure a cough fro cold. **Valerian**, in asthmatical and hysterical coughs (P). **Chloroform**, wit Morphine and molasses in paroxysmal dry cough; may be painted on thro also (R); in irritable reflex cough, the vapor of a teaspoonful of the spirit ma be inhaled from the surface of hot water, and repeated every five minutes fo four or five times (B); the inhalation of small quantities of chloroform give the greatest possible relief in the irritable cough of phthisis (Spencer Wells **Chloral**, in convulsive coughs, ameliorates symptoms after hypnotic effe (Wa). **Camphor**, equal parts of Camphor and Chloral triturated together a said to allay spasmodic cough when painted over larynx (B). **Glycerite** o **Tannin**, applied to throat when chronically inflamed and so producing cough often the case with children (R). **Grindelia**, used in cough of habit and spas modic cough (B). **Squill**, in catarrhal cough, should not be employed unt active inflammation has subsided (Wa); the syrup or vinegar of Squill is th best preparation for cough with tickling in the throat (P). **Cod-liver Oil**, i chronic coughs (R). **Lactucarium**, the syrup as vehicle in cough-mixtures (B). **Chamomile Oil**, gtt. ij–viij, in coughs due to heightened reflex irritability, especially in hysterical women (P). **Pix**, Tar-water in winter cough, especially when paroxysmal (R); allays the cough of bronchitis and phthisis (P); the Plaster as rubefacient and counter-irritant in chronic coughs (Wa). The frequency and violence of nervous coughs may be controlled by a determined effort of the patient's will. [Compare BRONCHITIS, PERTUSSIS, PHTHISIS.]

Prescriptions for Cough Mixtures.

℞. Spiritus Ætheris Nitrosi, ʒij.
Vini Ipecac., ... ℥ss.
Tinct. Opii Deodorat., . ʒj.
Syrupi Tolutani, q. s. *ad* ℥ij.
M. Sig.—A teaspoonful twice or thrice daily. (*Bowditch.*)

℞. Liq. Morph. Magendie,
Spt. Limonis, . . āā ʒj.
Syr. Ipecac.,
Spt. Lavand. Comp., āā ʒiv.
Syr. Scillæ Comp.,
Syr. Tolutani, . . āā ℥j.
Syr. Pruni Virgin., q. s. *ad* ℥vj.
M. Sig.—A teasp. as required.
Each dose has of Morph. Sulph. gr. $\frac{1}{24}$.

℞. Codeinæ, ... gr. v.
Alcoholis, . . q. s. *ad* solv.
Potassi Cyanidi, . . . gr. v.
Syr. Scillæ, ... ℥j.
Aquæ, ... q. s. *ad* ℥iv.
M. Sig.—A teasp. every 2 or 3 hours for irritable cough. (*Potter.*)

℞. Mist. Glycyrrh. Co., . . ℥ij.
Syr. Pruni Virginianæ,
Syr. Tolutani, . . āā ℥j.
M. Sig.—Half teaspoonful 3 or 4 times daily for infants, teaspoonful doses at 1 to 2 years, larger doses for older children.

℞. Tinct. Opii Deodorat.,
Vini Antimonii, . āā ʒss.
Ext. Valerianæ Fl.,
Syr. Simplicis, . . āā ʒij.
Aquæ, ... ℥jss.
M. Sig.—A teaspoonful every hour or two until cough controlled. For those of 4 years and upwards. (*Meigs & Pepper.*)

℞. Tinct. Sanguinariæ,
Tinct. Lobeliæ, . . āā ʒjss.
Vini Ipecac., ... ʒiij.
Tinct. Opii Camphorat.,
Syr. Scillæ, ... āā ℥jss.
Aquæ Cinnamomi, . *ad* ℥vj.
M. Sig.—ʒj every three hours in the cough of bronchitis. (*Potter.*)

Coxalgia.

Barium Chloride, in considerable doses (gr. j–ij) persevered in for a month, is thought to be most valuable in scrofulous diseases of the joints (Wa). **Sulphuric Acid**, ʒj ad ℥j Adipis, as ointment, persevered in, has resulted in great benefit; a powerful irritant (Wa). **Counter irritation**, by blisters around the hip, with perfect rest in the straight posture, Cod-liver Oil, etc. (D). **Ferrous Iodide**, in scrofulous diseases of the joints, with Cod-liver Oil and nutritious diet (Wa). **Iodoform**, very successfully used by many continental practitioners in scrofulous diseases of the joints (Wa). **Cod-liver Oil**, the remedy on which most reliance is to be placed (R). [Compare ABSCESS, CARIES, SUPPURATION, SYNOVITIS.]

Croup, Catarrhal.

Aconite, valuable (R); has been employed with the best results (P); gtt. ½ to j every half hour, until an impression is made on the fever movement, then every hour or two (B). **Hot Water**, applications beneath the chin and along the whole course of the larynx (Wa). Hot fomentations or turpentine stupe to throat (El); hot bath (95°–102°) in the paroxysm, a good method (M & P). **Potassium Bromide**, locally, a solution by atomization, has proved highly efficient in spasmodic croup (Wa). **Lobelia**, has been used with occasional success (P). **Ipecacuanha**, the syrup or fluid extract as an emetic at the outset (El); is a slower emetic than Tartar Emetic (P); the syrup to vomiting during the paroxysm, and ♏v–x every 2 or 3 hours next day (M & P). [Compare LARYNGISMUS STRIDULUS.]

℞. Potassii Citratis, . . . ʒj.
Syr. Ipecac., ... ʒij.
Tr. Opii Deodorat., . . gtt. xij.
Syr. Simplicis, ... ℥ij.
Aquæ, ... ℥jss.
M. Sig.—Teaspoonful every two hours at 2 years of age. In severe form of spasmodic laryngitis. (*M. & P.*)

℞. Tinct. Belladon., . . . gtt. iv.
Tinct. Opii Camph., . . gtt. l.
Pulv. Aluminis, ... gr. vj.
Syr. Acaciæ, ... ℥ss.
Aquæ, ... ℥jss.
M. Sig.—Teaspoonful every 2 or 3 hours at 6 months old when cough frequent and harassing. (*M. & P.*)

Croup, Membranous—Laryngeal Diphtheria.

Mercury, a remedy of established value, gr. ss–j of Calomel, with gr. ⅛–¼ of Ipecac, according to age every 2 hours, with local and other general measures, especially the use of a hot (70°–75°) and moist atmosphere (Wa); the Sub-sulphate, given early, is the best emetic, gr. iij–v; Calomel is strongly urged as a laryngeal sedative and aplastic agent, allaying laryngeal spasm and preventing formation of membrane (B). **Alum**, one of the best emetics in this disease, a teasp. in honey or syrup, repeated every ten or fifteen minutes until it operates (M & P); a very useful and non-depressant emetic (B). **Sanguinaria**, by many considered specific, is undoubtedly the best emetic for this disease (P); is too harsh and too uncertain in action (B). **Tartar Emetic**, as an emetic, has established value in croup (W); is injurious, too depressant (B). **Potassium Chlorate**, as alkali, after emetics, the most reliable internal remedy, gr. ij–iij every 2 hours to a child of 4 years (M & P). **Ferric Chloride**, may be combined with the preceding, in doses of 3–5 drops of the tincture at the same age (M & P). **Emetics**, besides the above, are: **Copper Sulphate**, in small frequent doses (R); **Ipecacuanha**, inferior to Mercury (B); in severe cases vomiting should be caused 2 or 3 times a day, and should be commenced early (R); **Apomorphine**, effective, but highly dangerous (B). **Senega**, is considered a valuable auxiliary (P); has been employed (R). **Quinine**, in full doses is highly useful (B). **Sulphurous Acid**, as spray, hourly or more frequently (R). **Tannin**, a 5 per cent. spray, several times a day for 15 or 20 minutes at a time (R). **Hydrogen Dioxide**, the solution, 1 in 4 of water, copiously sprayed over the nose, throat, mouth, etc., to destroy the membranes and prevent their reproduction; then **Glycozone**, a teasp. in a winegl. of water thrice daily internally, prevents any disturbance of the stomach and regulates the bowels (Edson). **Lactic Acid**, as solvent of membrane (B). **Iodine**, the tincture externally, affords great relief and tends to prevent formation of false membrane (Wa). **Water**, warm bath, hot fomentations or compresses to the throat; watery vapor in room. Steam inhalations, with a few drops of Iodine or Bromine. **Diet**, water only in small quantities during attack; supporting diet may be required afterward. **Lime-water**, by vaporization, or inhalations of the vapor of slaking lime for a few minutes in every hour, or some other alkaline solution during the whole treatment (M & P). **Tracheotomy**, fully justifiable, 21½ per cent. recovered out of 1024 operations; should be done when paroxysms become very frequent, and dyspnea is rather persistent than paroxysmal (M & P). [Compare LARYNGITIS, DIPHTHERIA.]

℞. Pulv. Sanguinariæ, . . gr. xx.
Pulv. Ipecac., ... gr. v.
Syr. Ipecac., ... ℥ij.
M. Sig.—A teasp. every ¼ hour until emesis, then ½ teasp. every hour. (*P.*)

℞. Acidi Lactici, ... ℥iijss.
Aq. Destillat., ... ℥x.
M. Sig.—To be used as a spray, or applied by a mop.
(*London Throat Hospital.*)

Cyanosis.

Amyl Nitrite, by inhalation, often gives marked relief (P). **Quebracho**, in that from asthmatic attacks of consumptives, lessened the cyanosis or entirely relieved it (Röhrer). **Oxygen**, by inhalation in the cyanosis of asphyxia from toxic gases or due to opium and chloroform narcosis. **Leeching** is of service, in a manner not easily understood (P). **Treatment** must depend on the nature of the lesion or disease giving rise to the cyanotic condition (A). [Compare ASPHYXIA, ASTHMA, DYSPNEA, HEART AFFECTIONS.]

Cystitis, Acute.

Belladonna, is a good remedy in almost every form of vesical irritation (G); very useful in recent catarrh from chill, with pain (P). **Cantharis**, in large doses causes inflammation of the urinary tract, but gtt. j of the tincture every hour will often relieve vesical catarrh (Smith); in small doses continued very efficient (B); gtt. j–v of the tincture thrice daily, when bladder is irritable, its sphincter weak, and pain along the urethra (P); may be employed in cystitis with benefit (R); in small doses the best remedy for acute cystitis. **Aconite**, for febrile symptoms (P). **Quinine**, often useful for acute symptoms (B). **Iodoform**, in suppository for painful cystitis (R). **Opium**, a rectal injection of Starch and Laudanum will subdue pain and prevent the frequent micturition (R); dangerous if the kidneys are diseased (P). **Alkalies**, the Citrates and Bicarbonates if urine is highly acid; stop when it becomes alkaline (R); Liquor Potassæ in barley-water or in a decoction of Triticum repens, preferred to all other alkalies; urine must be maintained at a neutral or very slightly acid reaction (Thompson). **Urotropin**, an excellent urinary antiseptic. [See page 430.] **Cannabis Indica**, an excellent anodyne in all bladder cases, having specific effect on that organ. **Rest** in horizontal posture, mucilaginous drinks, hot fomentations and hip-baths, laxatives for the bowels, light food. **Milk-diet** often necessary, especially in children. [Compare BLADDER IRRITABLE, CALCULUS, DYSURIA, ENURESIS, HEMATURIA.]

℞. Atropinæ Sulphatis, . . gr. j.
Acidi Acetici, ... gtt. xx.
Alcoholis,
Aquæ, ... āā ℥ss.
M. Sig.—Four drops in a winegl. of water before each meal. (*G.*)

℞. Pulv. Opii, ... gr. xij.
Camphoræ, ... gr. xxx.
Ext. Belladonnæ, . . . gr. iij.
Ol. Theobrom., ... q. s.
M. et div. in supposit. no. vj.
Sig.—One to be used at bed-time.

Cystitis, Chronic.

Benzoic Acid, and the Benzoates, in chronic cystitis from any cause, when urine is alkaline (B); has some balsamic character, and is useful in some cases of chronic cystitis; gr. xxiv in the day at least, in pills made with Glycerin (Thompson). **Sodii Benzoas**, ʒj in Tinct. Gelsemii ʒij–iij, and water to ℥vj, makes an excellent wash for painful cystitis of old men with enlarged prostate; a fluidounce should be warmed and injected and retained 20 to 30 minutes (Copeland). **Alkalies**, when urine is acid; the Liquor Potassæ, with Hyoscyamus as an anodyne, preferred notwithstanding its chemical incompatibility, to control painful and frequent micturition (Thompson); Bicarbonates or Citrates better, as the strong reaction of liq. potassæ unfits it to be given in doses sufficiently large to affect in any great degree the reaction of the urine (R). **Triticum**, is very efficient as an internal remedy, ℥ij–iv of the rhizome boiled in a quart of water until reduced to a pint, this strained to be taken in four doses in the 24 hours (Thompson); a very useful remedy (Pancoast). **Buchu**, is probably the most efficient of the urino-genital remedies, the fluid extract in doses of ♏x–ʒj (B); the best drug in chronic cystitis, especially when the catarrh implicates the ureters or the kidneys themselves, producing considerable muco-purulent discharge (P). **Uva Ursi**, is decidedly effective (P); is less so than Buchu (B). **Stigmata Maydis**, an infusion, ℥ij to the pint, a wineglassful every 3 or 4 hours, has been used internally with considerable success (Dessein). **Pareira**, considered superior to Uva Ursi (Brodie); often very successful (P). **Chimaphila**, is often very efficient, but is more actively diuretic than the above-named remedies (B); by many practitioners it is considered the best remedy for chronic cystitis. **Copaiba**, is very useful by virtue of its local action on the mucous membrane, but objectionable for its nauseous taste and resulting gastric disturbance (B). **Cubeb**, is often useful from its stimulating effect (P). **Turpentine**, has been useful in many cases (R); when cystitis is due to urethral inflammation or prostatic disease (B). **Juniper**, the oil is indicated under the same conditions as is Turpentine (B). **Eucalyptus**, there is no more efficient remedy in chronic cystitis than this (B); the oxygenated oil of Merck is best, in doses of 3 drops on sugar every 6 or 8 hours. **Myrtol**, has been used with excellent results in the Paris Hospital. **Salicylic Acid**, in large doses, either internally or by injection into the bladder, is most efficient (B); the acid or Salicylates often useful to prevent decomposition (P). **Salol**, proves an efficient disinfectant, as its constituents are excreted with the urine; solutions of 5 to 10 per cent. in Retinol gave gratifying results in subacute cases of obstinate character, where other agents were of no avail; this solution remains in the bladder, in diminishing quantity of course, after 6 or 8 urinations (Desnos). **Camphoric Acid**, in ½ to 3 per cent. solution in hot water, as injection, has cured several cases. **Carbolic Acid** and Sulpho-carbolates, to preserve the urine sweet (R). **Sulphites** will accomplish the same object (B); **Silver Nitrate**, by intra-vesical injection, gr. j in ℥iv to begin with, increased gradually to gr. ¾ to the ℥ at most (Thompson); stronger solutions are advocated by Professor Richardson of New Orleans, and Professor Gardiner of McGill College, Montreal; in the writer's experience a solution of gr. v to the ℥ used as a vesical wash, has been promptly efficient in curing many cases which resisted other treatment for months,—it sometimes produces serious symptoms, and it is therefore well to have a neutralizing solution of Sodium Chloride on hand for use if required. **Other Injections**, which may be used to wash out the bladder are—Lead Acetate, gr. j to ʒiv of warm water, once daily; Nitric Acid, dilute, ♏j–ij to ℥j of water. Tannic Acid, gr. j to ℥j; Borax, ℥j to ℥ij of glycerin and ℥ij of water, of which ℥ss in ℥iv of warm water for one injection; Quinine, gr. j–ij to ℥j of water, with a drop of Acetic Acid. All injections must be used with great care, not more than ℥ij forced in at once and that very slowly; use flexible catheter, warm solutions, and a rubber injecting-bottle with a long nozzle and stop-cock (Thompson); washing the bladder is of great value (R). **Evacuation** of the urine, some of which is often retained in the bladder, is a matter of great importance. **Ergotin**, hypodermically, increases the contractile power of the bladder, and enables it to empty itself more perfectly (Langenbeck). **Pichi**, the fluid extract, ♏xx to xxx four times daily, gave excellent results in bad cases of long standing, urine being alkaline, ammoniacal, ropy and purulent (Delamere). [Compare BLADDER IRRITABLE, CALCULUS, DYSURIA, ENURESIS, HEMATURIA.]

℞. Uvæ Ursi Fol.,
Pareiræ Radicis, . . aa ℥j–ij.
Sig.—Boil in 3 pints of water until reduced to a quart, then strain, and take 1 or 2 wineglassfuls 3 or 4 times daily.
(*Thompson.*)

℞. Ext. Tritici Repentis Fluidi,
Syr. Amygdalæ, . . . aa ℥ij.
M. Sig.—A dessertsp. in water 5 or 6 times daily. (*Pancoast.*)

℞. Quininæ Sulphatis, . . ʒss.
Acaciæ, ... ʒij.
Morphinæ Sulphatis, . gr. jss.
Aquæ, . . . q. s. *ad* ℥iij.
M. Sig.—A tablesp. to 3½ ounces of warm water, which inject in 3 parts, daily.

℞. Sodii Boratis, ... ℥j.
Glycerini,
Aquæ, ... aa ℥ij.
M. Sig.—Tablesp. in four ounces of warm water as an injection.

℞. Argenti Nitratis, . . . gr. vij.
Aquæ Destillat., . . . ℥ iijss.
M. Sig.—Injection every third or fourth day after washing the bladder out with warm water. (*Ricord.*)

℞. Ol. Terebinth., ... ℥ss.
Camphoræ, ... gr. xv.
Extr. Hyoscyami, . . gr. ss.
Fiat massa. Sig.—Take a piece the size of a cherry-stone morning and evening. (*Chauvel.*)

Cysts.

Iodine, by injection very effective in cysts of the neck, and sometimes in unilocular ovarian cysts (B); after tapping (R). **Silver Nitrate**, gtt. v–x of a strong solution (gr. xx ad ʒij), as injection into cystic tumors (wens), after allowing the contents to escape, will cure by setting up adhesive inflammation (B). **Galvano-puncture** will permanently occlude cysts of the neck (B). **Aurum Chloride**, may sometimes cure ovarian dropsy (B). **Remedies**, internally, have all proved worthless (E). [Compare OVARITIS.]

Deafness.

Quinine, cures some forms, and often causes deafness (Brown-Séquard). **Gycerin**, for dryness of meatus; also to form a film to ruptured tympanum (R); either alone or in combination with Olive Oil (P); effects are temporary (Wa). **Tannin**, the glycerite as application for throat deafness (R). **Gelsemium**, the tincture, ♏xv–xx, repeated 2 or 3 times a day, is often useful in the treatment of nervous deafness, and seems to have an influence on the organ of hearing similar to that of Nux Vomica on the organ of sight. **Colchicum**, when from gout in ear (A). **Cantharides**, as ointment; gr. xxx ad ℥j Adipis, below and behind the ear bis die, with alterative mercurial treatment, in deafness from thickened tympanum (Wa). **Collodion**, contractile, applied to the membrana tympani, in deafness from relaxation of the membrane, has exerted a permanently beneficial influence, even in cases of long standing (Wa). **Turpentine**, gtt. xl in ℥ss Glycerin, a few drops into the meatus in deafness depending on deficient secretion of cerumen, results in much benefit (Wa). **Morphine**, gr. ss, sprinkled on surface behind the ear denuded by a small blister, has proved curative in chronic deafness, after all other remedies had failed (Wa). **Gargles**, in throat-deafness are of great value; of Potassium Nitrate, Borax, etc., in sthenic cases; tincture of Capsicum added in nervous forms; of Hydrargyrum Bichloride when from secondary syphilis (Wa). **Water**, washing in warm water, in deafness from general debility (Toynbee). **Faradization** of the ear in nervous deafness, in which slight results only to be expected from the treatment (R); demands the utmost caution (Wa). **Inflation**, by the Politzer bag, or Eustachian catheter, in throat deafness. Remove wax from the external canal.

Delirium.

Belladonna, in delirium of typhus and other fevers (R); in severe forms of delirium (P). **Hyoscyamus**, in delirium of typhus; for the mild, less inflammatory form, with hallucinations, nervous excitement, little cerebral congestion (P). **Stramonium**, in wild and furious delirium of puerperal mania, with general restlessness and suicidal or destructive tendency (Wa); no drug deserving of more confidence in the greater number of maniacal cases (Cullen). **Opium**, in traumatic delirium, as a rectal injection, combined with Tartar Emetic in fevers; or better still Morphine hypodermically; Laudanum in low, muttering delirium (R); is regarded with suspicion (P). **Cannabis Indica**, the extract in doses of gr. ⅙–½ in nocturnal delirium occurring in softening of the brain (Wa). **Potassium Bromide**, in delirium resembling delirium tremens (R). **Camphor Monobromide**, useful in rambling delirium (Wa). **Camphor**, in

20 grain doses, every 2 or 3 hours, especially in low muttering delirium (R). **Chloral**, in violent delirium of fevers (R). **Antimony**, in delirium of fevers (R). [See FEVER.] **Water**, the cold douche in maniacal delirium; place patient in warm bath during application (R). [Compare CEREBRAL CONGESTION, FEVER, MANIA.]

Delirium Tremens.

Chloral, at outset (R); very successful, but dangerous to old drunkards or when heart disease exists (B); the experience of inebriate asylum physicians does not bear out the teaching that chloral is dangerous to old alcoholic cases, being by them commonly given in 30-grain doses every 3 or 4 hours until sleep is induced, without apparent danger. **Belladonna**, of proven efficacy when congestion of the brain (P); useful for the insomnia when coma vigil, cold surface, cyanosis (B). **Stramonium** can do all that Belladonna can do, and is more powerful (Tr). **Hyoscyamus**, in some forms admirable (P). **Hyoscine**, is a useful drug in delirium tremens, and in other affections in which tremor is a marked symptom (Weatherly). **Duboisine**, is even more sedative and hypnotic than Hyoscine. **Opium**, cautiously, if at all (B); as rectal injection, hypodermically or with spirits; if patient strong, delirium boisterous, and pulse full, add Tartar Emetic or Aconite (R). **Bromides** in the "horrors" preceding the delirium, ʒj every 4 to 6 hours; are of less value in the delirium, and in subsequent attacks (R); Ammonium Bromide has been used with very good results (Wa). **Chloroform**, inhalations to procure sleep (R); anesthetics are dangerous (B). **Cannabis Indica**, gr. ss–j of extract, one of the least dangerous and most useful hypnotics (P). **Tartar Emetic**, as hypnotic (B); combined with Opium to control mania and insomnia (R). **Capsicum**, to induce sleep in early stages, gr. xx–xxx in a bolus with honey, repeated after three hours (R); in 20–30 gr. doses has remarkable success (P); the tincture in ʒss doses every three hours of great benefit (Wa). **Nux Vomica**, or Strychnine, should be more freely used than it is in alcoholism, and in delirium tremens may be used hypodermically almost to the commencement of tetanic action (Luton). **Arnica**, the tincture is exceptionally serviceable in cases where there is depression (B). **Coffee**, often exceedingly useful (P). **Digitalis**, ʒss of tincture repeated in 4 to 6 hours (R); a tablesp. of the infusion every 4 hours in pale subjects, where anemia of brain, with effusion, and edema (B); has cured many cases promptly without producing any unfavorable symptoms; its safety and efficacy are alike questionable (Wa). **Cimicifuga**, an excellent tonic for the nervous system, is very successful (P). **Quinine**, with a mineral acid to restore digestion, in the "horrors," and in adynamic states (B); gr. j two or three times daily as a tonic, the best agent to produce nervous tranquillity (Anstie). **Sumbul**, very efficient for insomnia (P). **Zinc Phosphide**, gr. jss daily, in divided doses, for many weeks, is used with decided benefit. **Zinc Oxide**, is of essential benefit as a nerve tonic and sedative, gr. ij–viij, twice daily, gradually increased to the higher dose named (Wa). **Lupulin**, the tincture or oleo-resin, useful in mild cases as stomachic tonic and cerebral sedative (B). **Ammonium Carbonate**, when anemia of brain and feeble heart-action (B). **Conium**, combined with Opium, is useful (P). **Alcohol**, of undoubted use where failure of stomach to appropriate food (B); is best omitted entirely from the treatment, the experience in inebriate asylums showing that cases recover more rapidly and surely without alcohol. **Water**, about 60° with ice to head, to reduce temperature in the hyperpyrexia (R). **Treatment**, should tend to nourishment and establishing of digestion; concentrated liquid food with moderate use of stimulants (H). **Diet and Hygiene**, the immediate source of danger is exhaustion, hence animalized and nutritious, digestible diet should be used in fluid form, small quantities frequently repeated; beef tea, soups, yolk of eggs, warm milk, cocoa, cayenne pepper or stimulants in soups; coffee to still nervous excitement; hot baths and wet pack to eliminate the poison; a quiet, darkroom; sleep a necessity, often induced by Belladonna. [Compare ALCOHOLISM; also page 138, for Treatment of Delirium Tremens.]

℞. Tinct. Capsici,
Ext. Lupulini Fl., . . aa ℥j.
Mucil. Acaciæ, ... ℥ss.
Aquæ Cinnamomi, . . ʒjss.
M. Sig.—Dessertsp. as required for the wakefulness and excitement which precede an attack of delirium tremens.

℞. Chloralis Hydratis, . . ʒvj.
Ext. Conii Fl., ... ʒiij.
Ext. Hyoscyami Fl., . ʒiv.
Mucil. Acaciæ, ... ʒij.
Aquæ Menth. Virid., *ad* ℥ij.
M. Sig.—Teaspoonful in water after each meal, to prevent delirium tremens.

Dementia Paralytica.

Physostigma, has seemed to retard the progress of the disease in some few cases (B). **Paraldehyde**, in one or two drachm doses as a calmative and hypnotic, is as efficient as Chloral and without danger (B). **Tonics**, may be used, though treatment is only palliative; Calcium Lactophosphate, Cod-liver Oil, etc.; no remedies have hitherto been of any avail.

Dengue.

Emetics and Purgatives are indicated at the outset, also free diaphoresis. **Quinine**, in five-grain doses every four or five hours for the fever (Da C); should be given more for its tonic than for its antiperiodic effect (Fayrer). **Opium**, in some form for the pains and nocturnal restlessness. **Salicylic Acid** or Salicylates, for the pains in joints and muscles. **Carbolic Acid**, as lotion, a 4 per cent. solution for the itching, or Camphorated Oil. **Belladonna**, confers great relief, ♏x–xv of the tincture may be given every hour for two or three doses (Fayrer). **Aconite**, with salines and Nitrous Ether, during the pyrexia, which may be so high that cold sponging or the cold bath may be required. **Bitter Tonics**, as Gentian or Calumba, with Quinine and a mineral acid or Strychnine during convalescence. **Treatment**, is entirely symptomatic.

Dentition.

Belladonna, in convulsions of dentition, rarely fails to relieve (P). **Hyoscyamus**, to alleviate pain and subdue irritation; better than Opium for children (P). **Chamomilla**, ♏j of the tincture every ¼ hour, an excellent sedative for children (A. A. Smith). **Potassium Bromide**, for irritability and convulsions in teething (R). **Dulcamara**, the infusion, in the diarrhea of dentition, quickly checks symptoms (P). **Calumba**, excellent for the accompanying vomiting and diarrhea (P) **Hypophosphites**, of Calcium or Sodium, as a general tonic, are highly recommended (R). **Rhubarb**, with Soda, internally for the aphthæ, with perfect cleanliness of the mouth and a wash of Borax or Potassium Chlorate in Glycerin, gr. x to the ℥ (E. Smith). **Castor Oil**, for the diarrhea of dentition to clear out the bowels, then a mixture of Chalk and Catechu, or Zinc Oxide gr. j to the dose, with gtt. j of Laudanum if required to reduce peristalsis (Id). **Lancing the Gums** to relieve tension when gum is actually swollen; should not be indulged in indiscriminately.

℞. Potassii Bromidi, . . . ʒj.
Olei Anisi, ... ♏ij.
Mucil. Acaciæ,
Aq. Menth. Pip., . . aa ℥j.
M. Sig.—Teasp. every half-hour until the child is relieved. (B.)

℞. Sodii Bromidi, Sodii Bicarb.,
Chloralis, ... āā gr. xx.
Aq. Menth. Viridis, . . ℥jss.
Syr. Zingiberis, ... ʒss.
M. Sig.—Half-teasp. to a dessertsp., according to age.

Dhobie Itch.

Chrysarobin, gr. xx to the ℥ of vaselin, rubbed in twice daily, is almost invariably successful; stains the clothing, must not be applied to the face, and should be stopped when it causes an erythematous ring at the edge of the diseased patch (Mn). **Silver Nitrate**, a 4 per cent. solution in alcohol, painted over the surface daily, has given satisfaction in many cases. **Salicylic Acid**, in collodion, has many advocates [see formula below]. **Calcium Sulphide**, as in *Vleminck's Solution* [see formula below], applied every night 3 or 4 times, after a thorough use of soap and water, generally brings about a rapid cure (Mn). **Cassia Alata**, a tincture of the leaves painted on, or the crushed leaves themselves well rubbed in, are successful (Id). **Iodine**, the liniment freely applied and of double strength, is the best remedy for the ringworms of the thick-skinned natives (Id). **Zinc Oxide**, with Boric Acid and Starch, equal parts of each, as a dusting powder to the crutch and axillæ after the daily bath, to prevent infection of the skin (Id). **Dhobie Itch** is a term used in the far East for any itching, ringworm-like affection of any part of the skin, but most commonly refers to some form of epiphytic disease of the crutch or axilla. The chief parasites attacking these localities are—(1) the *trichophytons* or ordinary body ringworms, (2) *microsporon minutissimum* of erythrasma, and (3) the *diplococcus* of pemphigus contagiosus (Mn).

℞. Quick-lime, ... ℥j.
Precipitated Sulphur, . ℥ij.
Water, ... ℥xv.

Boil in an earthenware vessel until reduced to ℥x; after subsidence decant the sherry-colored fluid.

(*Vleminck's Solution.*)

℞. Ac. Salicylici, ... gr. xx.
Chrysarobini, ... gr. xxx.
Traumaticini, ... ℥j.

M. Sig.—Apply as a paint to the affected area.

(*Morrow.*)

Diabetes Insipidus.

Opium, large doses necessary, gr. vj–xij a day (B); combined with Gallic Acid, the most generally useful remedy (W). **Ergot** has cured many cases, the fluid extract in doses of ʒss–j thrice daily (Da C); one of the most efficient remedies (B); is the most useful remedy (R); but if used in large doses or long continued symptoms of ergotism appear and the drug has to be stopped (Ralfe). **Adrenal Extract**, has given good results [see page 165]. **Nitroglycerin**, has been employed with good results (Id). **Arsenic**, improves the general condition and given with other special remedies it greatly increases their power (Id). **Iron** and **Strychnine** are very useful for tonic effects (Da C). **Valerian**, in large, increasing doses (R); restrains the flow of urine but does not cure (B). **Sodium Salicylate**, in small doses, very effective in some cases. **Muscarine** has been used with apparent success (R). **Potassium Iodide** is curative in many cases of syphilitic origin (B). **Alum** has produced good results (B). **Jaborandi**, is used successfully to reduce the quantity of urine (B). **Krameria** lessens the quantity of urine (P). **Galvanism**, the constant current over the upper part of the spinal cord; or one pole to the loin and the other to the hypochondrium on the same side for a few minutes, then on the opposite side; or the anode to the nape of the neck and the cathode first to the loins and then to the epigastrium (Külz). **Diet**, a dry diet beneficial (B), but is very difficult to carry out.

Diabetes Mellitus.

Phosphoric Acid, largely diluted, assuages the inordinate thirst; in one case it seemed to act as a curative agent (Wa). **Arsenic**, when from fatty assimi- ion, in diabetes of hepatic origin, and in thin subjects (B); the Bromide is credited with several cures [see Aurum below]: the Lithiated Arsenical Water was used in 70 cases, with cure of 96 per cent. (Martineau); [see *infra* for formula.] **Morphine**, is very efficient in reducing sugar when used by mouth, but is of no value when employed subcutaneously, even in the same case (Bruce). **Opium** in large doses, gr. vj–xij a day, ameliorative. **Codeine**, is especially serviceable (B); abates thirst and controls appetite (R); its value much disputed (P); is of great value in many cases (W); is one of the best remedies in doses of gr. ¼–½ (Da C). **Jambul**, has given favorable results after abandoning all the usual remedies (Lawrence); in 2 severe cases, in which 7 and 3 per cent. of glucose were excreted, the urine was brought back to normal by preparations of the bark, and kept so for two years (Vix); should be given after meals, in water or wine sweetened with Saccharin. **Sodium Salicylate** has cured when all other drugs have failed (R); gr. x–xv in compound spirit of Lavender and water, thrice daily, is my favorite remedy (Da C). —*Caution!* the urine of patients taking Salicylic Acid gives the reaction of sugar with Trommer's test (R).

Ergot, is one of the useful drugs (Da C); decreases the quantity of sugar and the volume of urine. **Potassium Bromide**, gr. xx ter die, cured two cases in six weeks (Begbie); useless (Da C). **Krameria** lessens the quantity of urine (P). **Phosphates**, to avert failure of nutrition (B). **Aurum**, the Chloride is one of the promising remedies (B); the Bromide of Gold and Arsenic caused so much improvement in one case that he was accepted as a good risk by one of the foremost life insurance companies (E. A. Wood). **Iodoform**, in doses of gr. j–ij, rapidly reduced the sugar and caused its disappearance in 4 or 5 days in five cases, without any change in diet being made (Moleschott); the amount of testimony for its value in this disease is quite considerable (B). **Iodol**, can be advantageously substituted for Iodoform in all the diseases to which the latter is applicable (B). **Uranium Nitrate**, gr. i–iij, thrice daily has caused decided improvement in several cases (Hughes). **Aloin**, for the accompanying constipation (Da C). **Nux Vomica**, or Strychnine, is generally beneficial. **Calcium Lactophosphate** benefits the thin, nervous type of diabetic remarkably (B). **Antipyrin**, affects secretion, and has been used with benefit. **Methylene Blue**, has given satisfaction in two cases (Estay). **Orchitic and Adrenal Extracts** have been given with reported success. **Alkalies** are used on theoretical grounds, but have not produced much benefit; one case apparently cured by the diligent use of Ammonium Carbonate (B); are serviceable (Da C); alkaline mineral waters for diabetes of hepatic origin and in obese subjects, are extremely useful; tepid drinks for the intense thirst (B). **Salines**, a warm solution of the Phosphate and Chloride of Sodium, by intravenous injection in diabetic coma, produced astonishing results in one case (B). **Oxygen** as oxygenated water, instead of carbonated water, has been successfully used (Le Blond). **Glycerin** has produced good results (B); used in place of sugar (W). **Diet and Hygiene** are of the utmost importance; avoid amylaceous food and everything containing sugar, especially ordinary bread; use fresh, nutritious animal food, with bread of bran or almonds; warm baths, warm climate, flannel underclothing. Professor Lupo of Naples maintains that some cases may be cured by an exclusive vegetable diet, including all sorts of vegetables, and gives two cases in which this treatment proved successful. Professor Saundby permits the ingestion of the maximum amount of carbohydrates which the patient can assimilate. **Peanuts**, are an excellent article of food for diabetics, being rich in albumin, of which they contain 47 per cent., together with 19 per cent. of fat and non-nitrogenous extractive matters (Furbringer). **Milk-cure**, by skimmed milk, very successful, 6 to 10 pints daily; give *no other food* for six weeks, then animal food (R). **Saccharin**, as a substitute for sugar, does well for sweetening purposes, but is not a nutrient and has no influence on the disease. **Dulcin**, is sweeter than saccharin, and is harmless in reasonable doses, up to 24 grains in the day (Kobert). **Levulose**, is a saccharine food which can be taken freely and without any injury by diabetic patients; it most nearly approaches the ideal carbohydrate food indicated in diabetes (Hebra); it is assimilated well and nearly all oxidized by diabetics, who are able to partake freely of it in comparatively large quantity (Ebstein); sugar and sugar-forming food constitute more than half the nourishment needed by a healthy person, and it is the imperative duty of the physician to furnish a diabetic with a moderate amount thereof, to prevent death from inanition, and to lessen the danger of diabetic coma which is induced by a diet of meat alone (Leyden); Levulose, formerly very high in price, is now sold at a reasonable rate under the name *Diabetin*.

℞. Liq. Potassii Arsenitis, . ʒjss.
Tinct. Opii Deodorati, . ʒv.
Syrupi Zingiberis, . . . ℥j.
Aquæ Cinnamomi, . *ad* ℥iv.
M. Sig.—Teasp. thrice daily.

℞. Codeinæ, ... gr. viij.
Alcoholis, q. s. ad solv.
Syrupi, ... ℥ij.
Aquæ, ... q. s. *ad* ℥iv.
M. Sig.—A teasp. twice daily, the dose to be gradually increased up to a tablesp. (*Pavy.*)

℞. Lithii Carbonatis, . . . gr. xl.
Sodii Arsenatis, ... gr. j.
Ext. Gentianæ, ... gr. xx.
Ft. pil. no. xxv. Sig.—One night and morning until sugar disappears. (*Vigier.*)

℞. Sodii Arsenatis, ... gr. iij.
Aquæ, ... Oj.
A tablesp. of this with Lithii Carbonat. gr. iij, into a quart siphon filled with carbonated water, which is to be taken freely, as daily beverage. (*Martineau.*)

Diarrhea.

Mercury, in diarrhea of children with bad digestion, flatulent distention and clay-colored, pasty, stinking motions, gr. j of the Bichloride to ℥viij of water in doses of ʒj every hour; or still better Hydrarg. cum Creta, gr. ⅓ every hour or two, will restore the natural bilious color and limit the number of the stools (R); Calomel in minute doses, gr. $\frac{1}{20}$ to $\frac{1}{12}$ every half hour, is useful in the diarrhea and dysentery (ileo-colitis) of children, when there is much irritability of the stomach (B); in the acute or chronic diarrhea of children, characterized by slimy stools mixed with blood and accompanied by pain and straining, gr. j of the Bichloride to ℥x of water, in doses of ʒj, is very efficient, curing with remarkable speed and certainty (R); in mucous diarrhea, gr. j of the Bichloride to a quart of water, in doses of ʒj every hour (A. A. Smith). **Antipy**[illegible]**n**, in doses of gr. ½ to 1½, has rendered signal service in the diarrhea of infan[illegible] and children. **Aconite**, in diarrhea from chill, with high fever and cutting pa[illegible]ns in the abdomen (P). **Camphor**, in summer diarrhea and the preliminary diarrhea of Asiatic cholera (B); when from effluvia of drains or exposure t[illegible] cold (R); useful in many forms (P). **Opium**, is commonly used, but is best [illegible] when evacuations are very watery, combined with mineral Acids or with Lead A[illegible]etate (B); with Starch as an injection in severe cases (R). **Codeine**, gr. ss–j an[illegible]swer[illegible] most satisfactorily in the milder forms of diarrhea and leaves no unple[illegible]asa[illegible] after-effects (Braithwaite). **Ipecacuanha**, in summer diarrhea and dys[illegible]nte[illegible] of children with greenish stools (B); hourly drop-doses of the wine, espe[illegible]cial[illegible] if vomiting (R); when from nervous irritation, especially in young chi[illegible]ldr[illegible] (P). **Dulcamara**, in diarrhea of children from damp or with dentitio[illegible]n ([illegible] **Pulsatilla**, dyspeptic diarrhea, mucous discharges, active piles (P). **Qu**[illegible]**ini**[illegible] in periodic diarrhea, with dysentery and jaundice (B). **Veratrum Albu**[illegible]**m**, the vomiting and purging of summer diarrhea (R). **Podophyllum**, in ch[illegible]ron[illegible] with high-colored motions and cutting pains, also in morning diarrhe[illegible] (R[illegible] gr. $\frac{1}{20}$ to $\frac{1}{10}$, with occasional doses of Aconite, for vomiting and diarrh[illegible]ea o[illegible] gastro-enteritis and prolapse of rectum (P). **Chamomile**, an infusion in[illegible] summer diarrhea of adults, or in that of dentition (R); the Oil in diarrhea of[illegible] chil[illegible]ially from worms (P). **Arsenic**, for evacuation of undigeste[illegible] food

(B); gtt. j of Liq. Arsenicalis before meals when diarrhea excited by food; also in chronic and membranous forms (R). **Nux Vomica,** a very useful adjunct to other remedies (B); often of much service in epidemic diarrhea (P). **Sulphuric Acid,** in summer and choleraic diarrhea; small doses in the chronic form and in the straining diarrhea of children (R). **Magnesium Sulphate,** a teaspoonful in a wineglassful of water every 3 hours when intestinal inflammation (B); very efficient in acute diarrhea of soldiers. **Peptenzyme,** is excellent in cholera infantum and the summer diarrhea of children. **Balsam of Peru,** is excellent in diarrhea, with or without tenesmus (Tr). **Kola,** is useful in atonic diarrhea. **Zinc Salts,** are very efficient in the summer diarrhea of children (B). **Hæmatoxylon,** is devoid of irritating qualities and is well adapted to the diarrheas of young children. **Calumba,** in diarrhea due to relaxation of the mucous membrane and not dependent on inflammation (B). **Catechu,** in atonic diarrhea and in that following withdrawal of morphine or opium from habitues, also in the diarrhea of children; in the latter the tincture with Chalk-mixture is very serviceable. **Kino,** in atonic diarrhea; the tincture in doses of ʒj for the diarrhea resulting from the disuse of opium or morphine. **Coto,** the fluid extract, or Cotoin, is one of the new remedies for atonic diarrhea. **Tannic Acid,** is very useful in profuse and chronic diarrhea (B); with milk diet in chronic diarrhea and dysentery (S). **Potassium Bichromate,** in doses of gr. ss in trituration, for chronic diarrhea due to intestinal ulceration.

Castor Oil, in cathartic dose for diarrhea due to irritating material in the intestinal canal, as undigested food or irritant secretions, no remedy more useful (B); makes a good preparatory treatment for other medication. **Bismuth Subgallate,** gr. xx–xxx every 2 or 3 hours, does good service. **Bismuth Subnitrate,** is effective, requires large doses, gr. xxx–lx every 3 or 4 hours; is especially indicated when desire for stool is felt immediately after eating (B); gr. j hourly with milk, sometimes with gr. $\frac{1}{6}$ of gray powder in various forms of infantile diarrhea (R). **Bismuth and Ammonium Citrate,** in diarrhea without irritation but rather relaxation of the intestinal mucous membrane. **Bismuth Salicylate,** is highly praised in the diarrhea of phthisis and in that of typhoid. **Salol,** is very efficient in acute diarrhea due to action of microbes. **Resorcin,** gives very marked satisfaction in the diarrhea of children. **Thymol,** gr. xx to ʒij in 24 hours in divided doses for adults, is a very efficient internal antiseptic in all cases of diarrhea, especially that of phthisis, teething children, chronic diarrhea, etc. (Martini); avoid alcohol in any form with or after thymol, lest poisoning result. **Carbolic Acid,** very useful in fermentative diarrhea, especially combined with Bismuth in cholera nostras and cholera infantum (B). **Mineral Acids,** in painless, watery stools, light color and alkaline (B). **Alkalies,** Mistura Cretæ in sour-smelling stools (B); Sodium, Potassium or Magnesium Bicarbonates when acid canal (R). **Calcium Carbonate,** as Chalk-mixture, in the later stages, also in the diarrhea of typhoid or phthisis (R); may be combined with Opium and with vegetable astringents. **Lead Acetate,** with Opium as an injection (R); is excellent in all forms (B). **Rhubarb,** in early stages, to get rid of irritant, afterward to check the diarrhea (R); when torrefied it has no purgative power, but its astringency is retained. **Rumex,** in morning diarrhea (R). **Arnica,** checks exhausting diarrhea with great certainty (P). **Silver Nitrate,** in diarrhea of children, with white, pasty, and offensive stools; combined with Opium the most effective remedy for that of phthisis and typhoid (B). **Copper Sulphate,** the most effective astringent in chronic diarrhea and that of phthisis (B). **Ergot,** in persistent, chronic diarrhea (B). **Iodine,** one or two drops of tincture in diarrhea from atony of mucous membrane (B). **Diet,** should be cool or cold, light bland food; gruel, rice, arrowroot, whey, barley-water, in recent cases; in chronic cases the most digestible but nutritious food, as fresh fish, game, raw eggs, rice, mucilaginous drinks; Milk and Lime-water or Soda-water very useful; also raw meat pulp; avoid beef, pork, veal, and much starchy food. In most forms of diarrhea in children it is wise to cut off milk and substitute some artificial food (R). [Compare DYSENTERY, CHOLERA.]

℞. Bismuthi Subnit., . . . ʒj–ij.
Pepsini Saccharat., . . ʒss.
Zinci Oxidi, ... gr. vj–xij.
Trit. et div. in chartulas xij.
Sig.—One every four hours in summer diarrhea of children.

℞. Ac. Nitrici Diluti, . . ʒij.
Tinct. Camphoræ,
Tinct. Opii, ... aa ʒj.
Syr. Zingiberis, ... ℥iv.
Aq. Menthæ Pip., q.s. *ad* ℥vj.
M. Sig.—Tablesp. doses to be used after a cathartic. (*Hope's Mixture as modified by Thompson.*)

℞. Tinct. Opii Deodorat., . ♏x.
Bismuthi Subcarb., . . ʒjss.
Syrupi Zingiberis, . . . ʒvj.
Mist. Cretæ, . . q.s. *ad* ℥iv.
M. et fiat emulsum. Sig.—A teaspoonful every 2 or 3 hours, for a child of one year old, when the stools are acid and green. (*Goodhart.*)

℞. Plumbi Acetat., ... gr. xx.
Pulv. Opii, ... gr. x.
Fiat massa, et div. in pil. x.
Sig.—One twice daily.

℞. Spiritus Ætheris Co.,
Tinct. Opii Camph., . aa ℥j.
Syr. Simplicis, ... ℥ij.
M. Sig.—A dessertspoonful after each movement.

℞. Zinci Sulphatis,
Pulv. Opii,
Pulv. Ipecac., . . . aa gr. xij.
M. Fiant pil. no. xij. Sig.—One 3 or 4 times daily in chronic diarrhea of adults.

℞. Tinct. Opii Camph.,
Tinct. Catechu, . . aa ʒiij.
Mist. Cretæ, ... ℥x.
M. Sig.—A teaspoonful four or five times daily for children.

℞. Tinct. Opii Deodorati, . ʒj.
Tinct. Calumbæ, q. s. *ad* ℥ij.
M. Sig.—Teasp. in winegl. of water before meals.

℞. Zinci Oxidi, ... gr. xvij.
Sodii Bicarb., ... gr. viij.
M. et div. in chartulas iv.
Sig.—One every 6 hours.

℞. Sodii Bromidi, ... ʒss.
Mucil. Acaciæ,
Aquæ Puræ, . aa q. s. *ad* ℥ij.
M. Sig. — Teaspoonful every three hours in the diarrhea of dentition, for child less than a year old. (*A. A. Smith.*)

℞. Tinct. Opii Camph.,
Syr. Rhei Aromat., . aa ℥ss.
Aquæ Calcis, . q. s. *ad* ℥ij.
M. Sig.—A teasp. for children.

Diphtheria.

Antitoxin is eminently successful, particularly when the treatment is commenced early in the case. (See page 177.) **Mercury**, the Corrosive Chloride internally, with Ichthyol rubbed into the glands of the neck, employed with marvellous success (Davison); doses for 24 hours are gr. ¼ in ℥iv of water for young children, gr. ½ in ℥vj for children of 6 or 7 years, gr. ¾ in ℥viij for adults, with Ichthyol (as above) and Antipyrin by enema if much fever (Dale); the Bichloride has given me most success, with a gargle of Thymol or Boric Acid (Da C); gr. jss in ℥iv of glycerin and water, of which ʒj every ½ hour for 6 doses, then every hour night and day, to a child of 4 years (Grant-Bey); locally very efficient, gr. ij to Oj of water, applied on a cotton swab, which should be burned after one using; this hourly night and day (Oatman). **Hydrargyrum Cyanide**, in solution of gr. $\frac{1}{10}$ to the ℥, of which a teasp. every ½ hour day and night to older children and adults, with a gargle of the same solution (Sellden); gr. $\frac{1}{96}$–$\frac{1}{48}$, according to age, every hour or two (Erichsen); gr. $\frac{1}{7}$ in ℥iv of water, of which ʒj to iv as per age every hour (Schultz); used by homeopaths in Berlin almost entirely, sometimes alternated with Apis, but most efficacious alone; table of 484 cases so treated, with 28 deaths. (*Brit. Jour. Homœop.*, 1884, p. 382.) **Calomel** is next in importance to Quinine and Iron, has proved successful in cases where other means failed, gr. ⅙–¼ every

3 hours, with a little Dover s powder (Da C); checks plastic exudation, its use limited to children of good constitution with sthenic symptoms; gr. ½ to j every 2 or 3 hours, with or without Dover's powder (gr. j) or Ipecac (gr. j) till bowels become relaxed with greenish stools (Wa); gr. v repeated boldly every hour up to ʒiv, for a child of 3 years, until the stools appear like polyps in water-troughs, gelatinous and of a bright, dark-green hue,—then a dose of Castor Oil if salivation is feared (Reiter); the safest and most efficient germicide with which we can saturate the system; nothing like it in diphtheria, gr. ⅙–⅓ every hour, even gr. j every 2 hours has no bad effects, no salivation (Fowler).

Belladonna, an excellent remedy; if given early will abort the exudation and later is useful to sustain the heart (B); especially when throat and tonsils acutely inflamed and much swollen (R). **Pilocarpine**, used in 80 cases without a single death; produces free salivary discharge, but it is depressant to the heart (Guttmann); many opinions for and against it; is decidedly injurious in adynamic cases (B). **Quinine**, in tonic doses recommended from my experience (Da C); when headache with high temperature, vomiting, and symptoms of septic poisoning, then in full doses (Wa); is most useful after serious symptoms have abated, then with Iron and a mineral acid (Mackenzie). **Arsenic**, in medicinal doses for malignant cases, or when sloughing of throat (R); the Iodide, in doses of gr. $\frac{1}{20}$ every hour or so, (see under THROAT, SORE), an excellent remedy for the so-called diphtheritic sore throat. **Calcium Chlorate**, in solution locally as lotion for the mouth; considered almost specific by some; its chief utility is in removing fetor; may influence germs (R). **Potassium Chlorate**, grain-doses every ½ hour (Smith); is more largely used than any remedy, both internally and locally (B); in full doses with Liq. Cinchonæ, seems to be of service in some cases (Wa). **Carbolic Acid**, as a spray, a 5 per cent. solution in the atomizer cup; locally to the fauces, to remove fetor and destroy disease-germs (B); the strong acid in Glycerine as caustic on a mop or brush (W); with Iodine internally to prevent systemic infection (B). **Sodium Sulpho-carbolate**, internally, has been found useful in lieu of Carbolic Acid (Wa). **Salicylic Acid**, locally, and internally gr. x, has produced good results (B). **Sulphurous Acid**, the gas recommended by a royal commission in Victoria, as a means of arresting the disease; crude sulphur burned in the room, all apertures being closed (R); the official acid in full and frequent doses, causes rapid disappearance of the exudation, and improvement in the general condition; ʒj every ½ hour to an adult in severe cases, in ordinary ones every two hours; an 8-ounce mixture should have 2 or 3 ounces of syrup and be given in milk to young children (Snow). **Sodium Sulphite**, ʒj to ℥j aquæ, locally, an easily managed application (B); an injection for nares in nasal diphtheria (Da C). [See formula below.] **Sodium Hyposulphite**, in solution of ʒj to ℥ij of water, of which hourly doses of ʒj, to be retained in throat several minutes before being swallowed, an excellent local and constitutional remedy, which may also be used by a brush or spray to the throat, and by a syringe to the nares (Fruitnight). **Sodium Benzoate**, is highly efficient, 75 to 100 grains daily, according to age, also used locally (B). **Myrrh**, the tincture 4 parts, Glycerin 8 and Distilled Water to 200, of which ʒj to ʒiv as per age every hour or half-hour, used in nearly 300 cases with strikingly good success (Stroll). [See under MYRRHA, *ante*, page 385.] **Strychnine**, hypodermically, for the subsequent paralyses, which may be any form of motor paralysis.

Lime-water, dissolves false membrane; the vapor of slaking lime inhaled; or, better, Lime-water by atomizer to back of fauces, while patient inspires deeply (W). **Ferric Chloride**, as solution painted on or applied by spray to the throat (R); of no advantage locally, internally may serve by supporting the organism (B); the tincture, gtt. xx every 2 or 3 hours; or better the Perchloride, gr. ½ to j every 2 hours in syrup and water, is easier to take and doesn't hurt the throat (Da C); the solution is an ingredient of *Loeffler's Solution* (see formula below) for local use. **Thymol**, ʒj in Glycerin ℥j and Water ℥iij, is the best agent for use as a gargle (Da C). **Toluene**, with Menthol, Creolin, etc., as in *Loeffler's Solution*, which is applied on a swab of cotton every 3 hours for 4 or 5 days, after cleansing the surface; is highly efficient for destroying the bacilli and preventing absorption of toxin (Loeffler). **Hydrogen Dioxide**, the solution, as spray or gargle, is a very useful application, and may be diluted with 3 or 4 parts of water; is much more powerful against young bacilli of diphtheria than against those of two days old, and hence its value is especially available at the very outset of the disease, and as a prophylactic during epidemics thereof (Traugott). **Glycozone** internally, a tablesp. in a winegl. of water every 3 hours, has an excellent effect (Edson). **Tartaric Acid** locally, converts membrane into a gelatinous mass, easily expelled (Vidal). **Chloral**, a dilute solution in glycerin and water makes an excellent local application for the throat; internally may be used as a symptomatic remedy in the early stages, but not when the heart is weak. **Papain**, by atomized inhalation, is used to destroy the membrane. **Pineapple Juice and Papaya Juice**, used by sipping and swallowing the juice after chewing the pulp, highly efficient in India (Chambers); see page 415. **Boracic Acid**, in solution as gargle, ranks next best after Thymol (Da C). **Sulphur** and **Alum**, equal parts, powdered and blown into the throat at the moment of deep inspiration, as often as asphyxia is threatened, are efficient (Jones); Sulphur is a very old and efficient local remedy in diphtheria, the flowers (sublimed sulphur) rubbed up with water as a gargle, or blown upon the throat through a quill, was the method of Dr. Field, who had a great reputation in England a few years ago for curing this disease (*Lancet*). **Trypsin**, is a good solvent of the false membrane; of all remedies used with the spray-atomizer it has given me the largest percentage of recoveries (Fruitnight). **Chinolin**, a 5 per cent. solution painted over the affected parts with great advantage (Seifert); the tartrate in 10-grain doses internally (B). **Bromine**, the vapor by inhalation, is useful (Wa); a $\frac{1}{100}$ solution in distilled water, of which gtt. j–iij every ½ hour in a teasp. of sweetened water, using a glass spoon; and a saucer full of Bromine Water in the room, renewed every 12 hours, has seemed to be extremely efficient in a number of cases. **Iodine** as inhalation frequently; with use the solution may be increased to ℥ss at each inhalation (R). **Potassium Permanganate**, gr. ½ in distilled water internally and also used locally, is of undoubted benefit (B); is credited with brilliant results even in malignant cases. **Sanguinaria**, the best emetic, and by many is considered specific in this disease (P). **Lactic Acid**, ℥iijss to ℥x of distilled water, as gargle, on mop or by spray, to dissolve membrane (B). **Tannin**, a 5 per cent. solution as spray (R). **Cubeb**, very efficient in the catarrhal forms of diphtheria (Robinson); the freshly ground berries in large doses in early stages of the disease, a very successful treatment (Trideau). **Turpentine**, ʒj of the oil thrice daily, with ♏iv of Spiritus Ætheris as a corrective, at the same time using ice-bags and a gargle of Potassium Chlorate solution, and internally ½-ounce doses every 2 hours of a 2 per cent. solution of Sodium Salicylate (Roesse, Baruch). **Tar and Turpentine** vapor, made by burning in the room Coal-tar 7 parts to Oleum Terebinthinæ 3 (Delthil). **Methylene Blue**, was used with success after losing cases by other treatment; even in simple non-diphtheritic ulceration of the throat, patients would, after one or two applications of the solution, express themselves with delight as being cured (Rose). **Chlorine-water**, tablesp. doses internally and as a gargle, highly efficient; a mixture of Chlorine-water 2 parts and Distilled Water 1, of which ʒj internally every 2 or 3 hours, is by far the best treatment of this disease; no water should be given after the mixture (Schubert); as a prophylactic the same may be given 2 or 3 times daily (Id). **Nuclein**, has been used with benefit (see page 161). **Alcohol**, is probably as good a local antiseptic as any; diluted with equal parts of water, by hand-ball atomizer every ½ hour; is the prince of antiseptics, and the most perfect and reliable medicine in diphtheria of which we have any knowledge (Hills). **Stimulation**, freely, the essential part of the treatment; infants are not injuriously affected by teasp. doses of whiskey every ½ hour; stimulate for effect and not by dose; those cases do best which are stimulated freely and early (Da C); there is more danger from giving too little alcohol than from too much; a three-year-old child can comfortably take ℥j–

℥v of Cognac, or gr. xv of Musk or Camphor, or gr. xv–ʒj of Ammonium Carbonate in 24 hours; in the septic form especially, the intoxicating action of Alcohol is not experienced, and young children with general sepsis began to improve when their ℥iv of brandy were increased to ℥xvj daily (Jacobi). **Water,** as ice in the mouth and the wet pack to the throat, is extremely serviceable (B); Ice sucked, especially at commencement, and continued until the disease declines (R); Ice packed in bladders or thin india-rubber bags, to the throat (W). **Aliment,** good foods, wines or brandy, necessary from the start to maintain the patient's strength (R); a teasp. of glycerin every 3 or 4 hours, plenty of good soup and wine, nutritive enemata, are necessary to sustain the system. Moist inhalations. Temp. of room 68° Fah. Removal from the house wherein attacked is advisable. **Tracheotomy,** only in extremis (R); is not successful in diphtheria, though very much so in membranous croup (Da C). **Intubation of the Larynx,** as an alternative to tracheotomy, is enthusiastically advocated by many operators. [Compare CROUP MEMBRANOUS.]

℞. Hydrarg. Chlor. Corros., gr. jss.
Glycerini, ... ℥j.
Aquæ Destillatæ, . . . ℥iij.
M. Sig.—A teasp. every ½ hour for 6 doses, then every hour night and day to a child of four years. Also,—

℞. Ung. Iodoformi (1 in 10), rubbed in over swollen glands every 3 hours.
(*Grant-Bey.*)

℞. Sodii Sulphitis, ... ʒiij.
Glycerini, ... ʒij.
Aquæ, ... q. s. *ad* ℥iv.
M. Sig.—Nasal injection. (*Da Costa.*)

℞. Tinct. Ferri Chloridi, . ℥j.
Syrupi Tolutani,
Liq. Potassii Citratis, . āā ℥ijss.
M. Sig.—Teasp. to dessertsp. according to age, every 3 hours; ʒj=♏x of the tincture. (*Anderson.*)

℞. Hydrarg. Chlor. Corros., gr. j, may be added to the above formula, which should then be given in teasp. doses.

℞. Mentholi, ... 10 Gm.
Toluene, . . q. s. *ad* 36 Cc.
Dein adde—
Creolin, ... 2 Cc.
Liq. Ferri Chloridi, . . 4 Cc.
Alcoholis, . . q. s. *ad* 100 Cc.
Sig.—To be applied by cotton swab every 3 hours for 4 or 5 days.
(*Loeffler's Solution.*)

℞. Ac. Tartarici, ... ℥j.
Glycerini, ... ℥jss.
Aquæ Menth. Pip., q. s. *ad* ℥iv.
M. Sig.—Gargle frequently. (*Vidal.*)

℞. Tinct. Ferri Chloridi, . ℥j.
Potassii Chloratis, . . . ℥ss.
Misce et adde—
Aquæ, ... q. s. *ad* ℥viij.
Sig.—Gargle. (*Jacobi.*)

For the chemistry of this combination see under CHLORUM, *ante*, page 267. Glycerin should not be added, as in Dr. Jacobi's original ℞, which makes a mixture that may explode.

Dropsy.

Arsenic, in dropsy from feebleness of heart, and in old age (B); swelled feet from debility (R). **Aurum,** has an ancient reputation in several forms of dropsy (see page 209). **Digitalis,** one of the best remedies, especially in renal dropsy from acute desquamative nephritis; the infusion in doses of ℥ss (B); the fresh infusion best for that of heart disease, especially when tricuspid regurgitation (R); induces striking effects in cardiac dropsy, when scanty urine and venous engorgement; has high rank as a diuretic (P). **Apocynum Cannabinum,** actively diuretic (P). **Diuretin** has been employed with marked benefit in both cardiac and renal dropsy, in hepatic cirrhosis, and in various diseases of the heart and kidneys accompanied by edema; gr. xv several times daily, in aqueous solution, avoiding acids or acid vegetable juices. **Caffeine,** the Citrate in 5-grain doses is eminently diuretic; for objections to its use see page 232. **Cactus,** has long had a high reputation in dropsy among the natives of its habitat; is probably of service in cardiac dropsy. **Hydrargyrum,** a classical pill in dropsy with dyspnea from cardiac disease is the combination of Dr. Baillie, containing Mercury, Digitalis, and Squill (see formula below); Calomel in doses of gr. ss–ij is eminently diuretic, especially in cardiac dropsy, but by many it is thought to act by aiding the action of other diuretics. **Bryonia**, as a drastic purgative and diuretic; care necessary, as it depresses the heart; the infusion best (P). **Hellebore**, the tincture, in doses of gtt. v–xv, every 2 or 3 hours, very successful in dropsical effusions, especially in general anasarca after scarlatina (P). **Senega**, as a diuretic when dropsy is dependent on kidney disease; has been praised (P). **Chimaphila**, is useful as a diuretic in renal dropsy especially when loss of appetite and debility (P); may be substituted for Scoparius (B). **Juniper**, largely used as a diuretic in cardiac and renal dropsy (B); esteemed in post-scarlatinal dropsy (R). **Iron**, purgative chalybeate waters (B): the Liquor Ferri et Ammonii Acetatis (Basham's Mixture), in anemic dropsy (Da C). **Pilocarpus**, very valuable in renal dropsy when secretion of urine is much reduced or suppressed (B). **Jalap**, the compound Jalap powder, gr. xv–xx, with ʒ iij of Potas. Bitart. and a little Ginger, early in the morning, 2 or 3 times a week, no hydragogue superior in dropsy from Bright's disease (Wa). **Turpentine**, controls dropsy with albuminous urine, from non-desquamative renal disease; gtt. ss every 2 to 4 hours (P). **Colchicum**, as a hydragogue in hepatic and cardiac dropsy when patient is vigorous, also in post-scarlatinal dropsy (B). **Scoparius**, esteemed by English physicians (B); is most useful in cardiac dropsy; Cullen found it the most certain diuretic: diluents should be freely used with it (P). **Squill**, in cardiac dropsy; cautiously if from kidney disease; if anemic add Iron (R). **Taraxacum**, is occasionally used as a diuretic, with limited utility (B). **Copaiba**, gives good results, especially in ascites, which see for formula (B). **Potassium Bitartrate and Acetate**, are very certain as diuretics when largely diluted with water, as cream-of-tartar lemonade; indicated in desquamative nephritis, and in general dropsy from valvular disease of the heart (R). **Elaterium**, of unquestionable value as a derivative in many passive forms of dropsy, though many fear it (P). **Acupuncture**, or better still, incisions from ¼ to an inch long, one over each external malleolus generally sufficient; a hot sponge, moistened with weak carbolic acid solution kept to incisions (R). **Aliment**, dry diet is of advantage in dropsy of serous cavities (B); should be light in acute dropsies; nourishing in chronic. Water not injurious but beneficial as drink. Warm baths, Holland gin in small doses, tapping for alleviation in incurable cases. A moderately warm, dry atmosphere. Skim-milk diet said to be of great value in renal dropsy. [Compare ASCITES, HYDROCELE, HYDROCEPHALUS, HYDROTHORAX, etc.]

℞. Pulv. Scillæ,
Pulv. Digitalis, . . . āā ʒ ss.
Potassii Nitratis, . . . ʒ j.
M. Fiat massa et div. in pil. xxx.
Sig.—One pill thrice daily.

℞. Potassii Acetatis, . . . ʒ vss.
Spt. Ætheris Nitrosi, . . ℥ ij.
Aquæ, ... q. s. *ad* ℥ viij.
M. Sig.—Tablesp. every 3 or 4 hours.

℞. Potassii Bitartrat., . . . ℥ j.
Ext. Taraxaci, ... ℥ ss.
Decocti Taxaraci, . . . ℥ viij.
M. Sig.—½ wineglassful twice or thrice daily.

℞. Aceti Scillæ, ... ℥ ss.
Infusi Digitalis, q. s. *ad* ℥ iv.
M. Sig.—A tablesp. 2 or 3 times daily.

℞. Pulv. Digitalis, ... gr. j–jss.
Pulv. Scillæ, ... gr. j.
Hydrarg. cum Creta *vel*
Pil. Hydrargyri, . . . gr. j–iij.
Ft. pil. no. j. Mitte tales xxiv.
Sig.—One pill thrice daily.

℞. Liq. Ferri et Ammonii
Acetatis (U. S. P.), . ℥ vj.
Sig.—Dessertsp. or two, three or four times daily. (*Basham's Mixture.*)

℞. Elaterini, ... gr. j.
Spt. Ætheris Nitrosi, . ℥ ij.
Tinct. Scillæ,
Tinct. Colchici, . . . āā ℥ ss.
Syr. Simplicis, ... ℥ j.
M. Sig.—A teaspoonful 3 or 4 times daily, for hepatic and cardiac dropsy in sthenic subjects.

Duodenal Catarrh.

Salol, is the most efficient remedy. **Sodium Phosphate**, ʒj four times daily, extremely efficient in catarrhal conditions of the duodenum and bile-ducts, resulting in jaundice, hepatic colic, etc. (B). **Vichy Water**, in similar conditions, probably owes its efficacy to the Sodium Phosphate contained in it (B). **Potassium Bichromate**, in doses of gr. $\frac{1}{10}$–$\frac{1}{6}$, two or three times a day, is an excellent remedy in so-called duodenal dyspepsia, manifested by a bitter taste, coated tongue, pale stools, vomiting of glairy fluid and dull pain in right hypochondrium. **Arsenic**, has been used with success in jaundice from catarrh of bile-ducts after duodenal catarrh (B). **Aurum** salts will often remove duodenal catarrh and that of the bile-ducts, also the jaundice therefrom (B). **Podophyllum**, in catarrhal and malarial duodenitis. **Nitro-muriatic Acid**, internally in mucous duodenitis; also as bath to right hypochondrium (ʒiij to gal. j), temp. of bath 96° (B). **Aliment**, no starches or fats; milk, eggs, oysters, beef-broth, broiled or raw beefsteak, white-fish (B); the diet should be exclusively animal, in order to let the stomach deal with it. [Compare JAUNDICE, BILIOUSNESS.]

Dysentery.

Ipecacuanha, is the remedy for acute dysentery of the ordinary type; large doses; gr. xxv–xxx (P); gr. xv in milk (B); valuable in acute or epidemic forms, also in summer dysentery of children, with greenish stools, mucus and blood, gr. ij–v every 2 hours in milk (B); in dysenteric diarrhea of children, especially with vomiting, which will often yield to hourly drop doses of Ipecac wine (R). [See page 360 for the method of administration.] **Castor Oil**, as a mild cathartic, is very valuable in appropriate cases (Wa); gtt. v every hour, in water with sugar and gum, is excellent for dysenteric diarrhea of children (Smith): ℥j of the oil, guarded by 10 to 20 drops of laudanum, the best preliminary treatment for all cases of catarrhal dysentery. **Magnesium Sulphate**, drachm doses of a saturated solution with ♏x of dilute sulphuric acid, every hour, gives striking results in acute tropical dysentery (Thorpe); ʒiv of a sat. sol. with ♏xv of ac. sulph. dil. every 2 hours, and a milk diet, acted like magic in all my cases of tropical dysentery (Wiglesworth); produced complete and permanent cure in a bad case from India, in which many other remedies had no effect (Alexander); the best remedy for acute dysentery, especially when fever, pain, tenesmus, and stools containing mucus and blood (B). **Sulphuric Acid**, dilute, with saline purgatives (B); a remedy much used in India contains Ac. Sulph. Dil. j; Vin. Ipecac., j; Tinct. Opii, j; Ol. Ricini, v; well shaken and given in doses of 5 to 12 drops frequently, the smaller dose as often as half-hourly. **Opium**, as enema, with starch and milk, after canal is emptied by salines; indispensable in chronic dysentery (B); for the purging (R); a remedy of great value, and applicable to every stage and every form of the disease, allaying pain and vascular excitement, moderating peristalsis, promoting the cutaneous secretion; is inferior to Ipecac in acute dysentery, and is most valuable in the chronic form (Wa). **Silver Nitrate**, in pill, gr. ¼–j, with Opium, in acute dysentery after subsidence of acute symptoms; also an enema beyond the sigmoid flexure (gr. x–xx ad Oj aquæ) using from 3 to 6 pints (O): also as escharotic through speculum to ulcer of rectum (B); a solution of 1 in 1000 as antiseptic wash daily, up to 60 washes in series, entirely successful in many cases of the recurrent form of tropical dysentery, having lasted from 1 to 5 years (Gallay, Surgeon-Major for French Colonies). **Potassium Bitartrate**, in acute dysentery with scorbutic symptoms, as seen in miners, sailors, etc.; a full cathartic dose, ℥ss or more, has acted most beneficially as a preliminary to other treatment, and in many cases has proven to be the only remedy required. **Bismuth Subnitrate**, in doses of gr. xv–xx every hour or so, is highly efficient; may also be used in suspension with Starch or Chalk-mixture, as a rectal injection. **Bismuth Subgallate**, may be used instead of the subnitrate and in the same doses, or 30 grains may be given at longer intervals. **Bismuth Salicylate**, gr. xv in milk or cachet 4 times daily; gr. xx twice daily with gr. ij of Ammonium Carbonate to prevent flatulence (Tirard). **Quinine**, when periodic (B); in malarial subjects is as successful as Ipecacuanha in dysentery of the ordinary type (P); in warm solutions, 1 in 1000 to 1 in 5000, as rectal injections for amebic dysentery, the amebæ being rapidly destroyed thereby (Ty). **Ailanthus Glandulosa**, as infusion, sometimes succeeds where other measures have failed, and seems to be especially serviceable when the case has become subacute or chronic (Mn). **Monsonia Ovata**, a tincture gave wonderful results in chronic cases and in acute ones which had resisted the ordinary remedies (Maberly). **Methylene Blue**, may be of use in amèbic dysentery, on account of its being partially excreted by the feces (Armstrong). **Mercury**, in minute doses for the ileo-colitis of children; gr. $\frac{1}{20}$ to $\frac{1}{12}$ of Calomel or Hydrargyrum cum Creta every half hour (B); gr. $\frac{1}{100}$ of the Bichloride hourly or every 2 hours, in acute or chronic dysentery if stools are slimy or bloody (R); Calomel in fractional doses every hour, is most in vogue in Germany, and is best suited to the croupous form (Mn). **Zinc Sulpho-carbolate**, gr. ij–iij in pill 4 or 5 times a day as an intestinal antiseptic. **Salol**, is highly efficient as an intestinal antiseptic. **Tannic Acid**, in solution, ʒj to the pint, by rectal irrigation, as an intestinal antiseptic. **Cinnamon**, sometimes does good in chronic dysentery, may be combined with Ailanthus (Mn). **Iron**, weak solutions of the tincture of the Chloride for irrigation of the bowel have been used in bad cases with great benefit; the Pernitrate for the anemia in chronic dysentery (Maclean); sometimes useful in the chronic army form (B). **Balsam of Peru**, 3 grains, with alcohol ʒj, syrup of lemons ʒiv and water ℥iij, excellent for dysentery (Tr). **Arnica**, is highly extolled as an internal remedy for cases where the vital powers are depressed (Wa). **Gamboge**, gr. ¼ internally in the 24 hours, exceedingly valuable in young persons (P). **Matico**, the infusion by mouth and rectum was found serviceable in the malignant hemorrhagic dysentery occurring in Trinidad. **Glycerin**, with infusion of Linseed, 1 to 4, to allay tenesmus (B). **Lead Acetate**, as enemata, in acute and chronic dysentery to allay tenesmus (B); with Ipecac and Opium in pill, for acute form (Da C). **Hamamelis**, when the discharges contain much blood (R). **Aconite**, when fever and cutting pains (P). **Nux Vomica**, in epidemic dysentery (P); prune-juice stools, much gas, vital depression (B). **Arsenic**, Fowler's solution gtt. ij with gtt. v of Opium often benefits (B). **Copper Sulphate**, useful in acute dysentery; in chronic the most valuable astringent (B); gr. x–xx ad Oj aquæ (R). **Ergot**, in chronic after acute, and also in the acute form (R). **Grape-cure**, is used successfully in the chronic form (P). **Calumba**, is of great value in chronic dysentery with ulceration of colon (P). **Chekan**, is used with benefit. **Injections** of mucilaginous enemata (as Linseed) are of great value (R). **Diet** is of prime importance (B); avoid animal food and stimulants, liquid foods best, all to be cold (R); milk diet alone during exacerbations. Boiled and peptonized milk, light animal broths and beef-juice, not beef teas; barley or rice may be added to such broths, but should be thoroughly cooked (Ty). **Colostomy** was done on an old and bad case of amebic dysentery, the colon then irrigated daily with a weak solution of hydrogen peroxide, resulting in immediate relief from pain and finally complete cure (Barbat). [Compare DIARRHEA, ENTERITIS, SPRUE.]

℞. Morphinæ Sulph., ... gr. ij.
Strychninæ Sulph., . . . gr. ¼.
Ac. Sulphurici Dil., . . . ℥ss.
Aquæ Camphoræ, ... ℥iijss.

M. Sig.—A teasp. well diluted every hour or two. In epidemic dysentery with prune-juice stools and marked depression.

℞. Plumbi Acetatis, ... gr. xxiv.
Ipecacuanhæ,
Pulv. Opii, ... āā gr. iij.

Fiant pil. no. xij. Sig.—One pill every 2 hours until blood ceases, then at longer intervals. (*Da Costa.*)

℞. Magnesii Sulphatis, . . . ℥viij.
Ac. Sulphurici Dil., . . . ʒss.
Aquæ, ... ℥viij.
M. Sig.—Tablesp. in a winegl. of water every hour or two until it operates. (B.)

℞. Ext. Ergotæ Fl., ... ℥iijss.
Tinct. Opii Deodorati, . . ʒss.
M. Sig.—A teasp. thrice daily. (*Andrew.*)

℞. Plumbi Acetatis, ... gr. iv.
Morph. Acetatis, ... gr. ss.
Aquæ Fervid., ... ℥j.
M. Sig.—Enema to allay tenesmus.

℞. Ferri Sulphatis, ... gr. xl.
Pulv. Opii, ... gr. xx.
Fiant pil. no. xx. Sig.—One pill thrice daily, in chronic dysentery.

Dysmenorrhea.

Ammonia, the Aromatic Spirit in doses of ʒj every 4 hours or oftener, a thoroughly trustworthy remedy, and should be used in place of the alcoholic stimulants generally prescribed (Illingworth). **Ammonium Acetate**, has remarkable power over many forms of dysmenorrhea; the Liq. Ammonii Acetatis, in ℥ss doses, with gr. ⅓ of Ipecac, every 2 or 3 hours, to keep up the action of the skin until the flow is well established (E). **Antipyrin**, as an analgesic, is efficient. **Acetanilid**, is equally efficient for the pain. **Cimicifuga**, relieves pain in the congestive variety and is decidedly useful (P); is said to be very efficient (R); is valuable (Wa). **Opium**, necessary when pain is very severe; one hypodermic of Morphine at each period is often sufficient (Wa). **Codeine**, when Morphine is not well borne, has given very complete satisfaction in several cases; gr. ¼ to ½ morning and evening (Oliver). **Gelsemium**, relieves pain in the neuralgic form, ♏v–x of the fluid extract every 2 hours (B). **Chloroform**, as the liniment on a flannel wrung out of hot water, or by inhalation as an anesthetic when pains very severe; sometimes exerts a permanent influence (Wa). **Ergot**, given when the molimen begins, is useful in the congestive form (B). **Amyl Nitrite**, may be inhaled with benefit in the neuralgic variety, especially in chlorotic girls (Wa). **Sodium Borate**, in the membranous form, has been used with great benefit combined with Ext. Belladonnæ (Wa). **Camphor**, is my favorite remedy, gr. x in mucilage and Cinnamon-water; repeat the dose in an hour or two if necessary (Dewees). **Guaiacum**, is very useful (P); drachm doses of the ammoniated tincture in the neuralgic or rheumatic forms (B). **Caulophyllum**, is by many considered the best curative remedy for spasmodic dysmenorrhea, if given in the intervals. **Viburnum Opulus**, the fluid extract, in half-drachm doses, has considerable reputation in some sections for uterine pains of various kinds, and is useful in the spasmodic variety of this affection; may be used in combination with Cannabis Indica (Thomas). **Arsenic**, gtt. iij–x of Fowler's sol. with gtt. x of Tinct. Digitalis, ter die between the periods, gives excellent results (Athill); indicated when copious membranous discharge from bowels and uterus (R). **Cannabis Indica**, is very useful as a palliative in painful menstruation (B); gr. ss–j thrice daily to relieve the pain (R). **Nux Vomica**, in neuralgic form; Syrup or Elixir of Iron, Quinine and Strychnine (B). **Apiol**, neuralgic form (B); as emmenagogue, night and morning, for several days near the period (Wa). **Pulsatilla**, in the functional form; is of much benefit when discharge is scanty or profuse, black and clotted; should be persevered in for two months or more (P); gtt. ij every hour is most effective when the affection is not of membranous, obstructive, or neuralgic character (Smith). **Hydrastinine**, has been used with benefit. [See under MENORRHAGIA.] **Chloralamid**, in one dose of gr. xxx, to prevent an impending attack, has been of service. **Belladonna**, in neuralgic or spasmodic forms, dark and fetid discharge, crampy pains, and cold chills; a suppository or mild injection together with internal administration, will relieve (P); in neuralgic dysmenorrhea it will permanently relieve (B). **Aconite**, a valuable remedy when commenced early (P); for the congestive form in plethoric subjects (B). **Aletris**, is advertised as a highly efficient agent. **Carbonic Acid**, injected into the vagina (see page 93). **Electricity**: in neuralgic, a galvanic current; in congestive, the inverse current (B). **Croton-chloral**, in neuralgic form (R). **Iron, if depending on anemia** (B). [See AMENORRHEA for formula.] **Cajuput Oil**, said to relieve the pains (R). **Rue and Sumbul**, are reported useful (P). **Emetic of Ipecac**, with warm covering in bed, feet in hot water, hot ginger tea, Liquor Ammonii Acetatis; if pain very severe, a suppository of Morphine and Belladonna per rectum; best to avoid anodynes (E). **Accessories**, spinal ice-bag, when scanty discharge; when menorrhagic, hot water spinal-bag; sitz-baths, either hot or cold, or cold alone, during intervals.

℞. Ext. Cimicifugæ Fl., . . . ʒ iv.
Ext. Pulsatillæ Fl., . . . ʒ jss.
Ext. Eriodyctii Fl., . . . ℥ j.
Syr. Aurantii, . . q. s. *ad* ℥ iv.
M. Sig.—One or two teasp. every two hours, for six doses.

℞. Ext. Belladonnæ, ... gr. iv.
Ext. Stramonii,
Ext. Hyoscyami, . . . aa gr. v.
Quininæ Sulphatis, ... gr. xl.
Fiant pil. no. xx. Sig.—One pill thrice daily, in neuralgic dysmenorrhea.

℞. Ext. Viburni Prunifol. Fl., ℥ ij.
Ext. Senec. Aurei, . . . ℥ ij.
Tinct. Guaiaci Volat., . . ʒ xij.
M. Sig.—A teasp. in new milk, thrice daily, between attacks, ʒ j every hour during attack, and a hot sitz-bath.

℞. Ext. Ergotæ Fl., . . . ʒ vij.
Tinct. Gelsemii, ... ʒ j.
Tinct. Aconiti, ... ♏ xvj.
M. Sig.—Teasp. every 2, 3, or 4 hours. In congestive dysmenorrhea.

℞. Ext. Opii, ... gr. v.
Ext. Cannabis Ind.,
Ext. Hyoscyami, . . aa gr. x.
Camphoræ, ... gr. xxv.
M. Fiant pil. no. x. Sig.—One pill two or three times daily. (*McLane.*)

℞. Ext. Cannabis Ind. Fl., . ʒ jss.
Ext. Viburni Op. Fl., . ʒ vj.
Mucil. Acaciæ, ... ℥ iij.
Aq. Cinnamomi, q. s. *ad* ℥ iv.
M. Sig.—Dessertsp. every 4 to 6 hours.

Dyspepsia.

Pepsin, is very beneficial; Scheffer's or Beale's saccharated pepsin with diluted HCl acid (B): is especially adapted to gastric indigestion. **Pancreatin**, for intestinal indigestion; Liquor Pancreaticus to peptonize milk, gruel, soups, etc., before administration; in cases of great digestive debility. **Peptenzyme**, is said to be very efficient. **Papain** (Papoid), acts equally well in gastric and intestinal indigestion, and hence is particularly indicated in cases of difficult diagnosis as to the location of the trouble; is used in the various forms of dyspepsia and indigestion with most excellent results; has marked proteolytic action in acid, alkaline and neutral solutions, and in the presence of many chemicals, antiseptics and therapeutic agents (Chittenden). **Ingluvin**, also promotes digestion (B). **Pineapple Juice** has the power of digesting proteids (Marcano); the fresh juice is a very constant and powerful digestant of albuminous matters, its ferment being decidedly active in the presence of either acids or alkaline carbonates, but most energetic in neutral solution and between 122° and 140° F. (Chittenden). **Mineral Acids**, Hydrochloric or Lactic with Pepsin after meals in atonic dyspepsia; Hydrochloric after meals for acid pyrosis; Nitro-muriatic for dyspepsia with mental despondency, oxalates in urine, offensive gas, sallow complexion (R); Phosphoric, dilute, very efficient before meals (Da C). **Sulphurous Acid**, ♏ v–ʒ j, well diluted, for acid pyrosis (B). **Alkaline Mineral Waters**, before meals in atonic dyspepsia, and highly useful in the dyspepsia of obese subjects (B). **Alkalies**, shortly before a meal; increase the gastric juice, and are usually better than acids in atonic dyspepsia; Sodium Bicarbonate is the best (R); a full dose (gr. xl–lx) in dyspeptic attacks, with flatulence, etc., usually affords speedy relief (Wa); Lime-water is often efficient. **Chloroform**, gtt. xv–xx in sweetened water, when rapid fermentation of food and evolution of gas soon after eating; is promptly efficient in giving relief (Willis); a highly efficient remedy in acute dyspepsia. **Chloral**, is a very good remedy in doses of 5 to 10 grains in ℥ j of cinnamon water; acts as gastric antiseptic and sedative, and is efficient in the nervous dyspepsia of neurotic subjects, with severe gastric pain. **Arsenic**, drop doses of Fowler's solution before meals in irritative dyspepsia (B); also when diarrhea is excited by food (R). **Bryonia**, in dyspepsia of liver origin, and bilious headache with vomiting (P). **Charcoal**, when flatulence; Nux Vomica in 5 ♏ doses before meals, better (R). **Mercury**, Gray powder, gr. j 3 or 4 times a day, when dyspepsia during chronic disease or convalescence; if constipated, Calomel, gr. ss, with Ext. Hyoscyami, gr. iij, in pill for 3 nights (R); the Yellow Oxide, in doses of gr. $\frac{1}{60}$–$\frac{1}{30}$, for dyspepsia septica and kindred disorders of the alimentary canal; remarkably efficient in Austrian navy (Schaffer). **Ipecacuanha**, ♏v–x of the wine most valuable in atonic and chronic catarrhal dyspepsia (P); constipation, depression, food like a heavy weight (R). **Hydrastis**, gtt. v–xv of the tincture before meals, a good stomachic tonic (B); in chronic dyspepsia, sluggish liver (P). **Pulsatilla**, a good remedy when depression with fear of death, white-coated tongue, little or greasy taste, nausea, flatulency, heartburn; gtt. v in water every 4 hours (P). **Cannabis Indica**, often renders good service in indigestion.

Nux Vomica, gtt. v–x ter in die before meals as stomachic tonic (B); when flatulence, weight on head, and heartburn (R); often of the highest possible value in simple atonic form, or in the dyspepsia of drunkards (P). **Cinchona**, with mineral acids in atonic dyspepsia (P). **Quinine**, especially for town-dwellers and elderly people; checks excessive fermentation in alimentary canal (R). **Chamomile**, ♏ij of oil, very useful in atonic dyspepsia (P). **Ignatia**, useful in nervous dyspepsia (P). **Taraxacum**, certainly does good in simple atonic dyspepsia (P). **Belladonna**, gr. ⅙ to ¼ of the extract, once a day when there is constipation (R). **Bismuth**, mixed with vegetable Charcoal in flatulent dyspepsia (R); gr. x with same quantity of Calcined Magnesia, in chronic gastric catarrh where diet cannot be regulated (Rose); the Subgallate (Dermatol) is said to be an efficient remedy. **Aurum**, the Chloride is useful in nervous dyspepsia (see page 209) **Manganese**, gr. x–xv of the Black Oxide in gastrodynia and pyrosis (B). **Sanguinaria**, gtt. ij–v of tincture or gr. $\frac{1}{12}$ of alkaloid, in atonic dyspepsia promotes secretion and increases the appetite (B). **Silver Oxide**, ½-grain doses with same quantity of Ext. Hyoscyami before meals in nervous dyspepsia (B). **Xanthoxylum**, as stomachic tonic, ʒj of the fl. ext. in atonic dyspepsia (B). **Simple Bitters**, Calumba is the best; Quassia or Gentian or infusions of them as vehicles for acids and alkalies (B); Calumba is easily tolerated when the stomach is weak (R); Gentian as stomachic and tonic, very useful in atonic dyspepsia and that of gouty subjects; the tinct. in some aromatic water, or in combination with alkalies and sedatives (Wa); Chirata is particularly serviceable in the dyspepsia of gouty subjects. **Rhamnus Purshiana**, in all cases of dyspepsia associated with a torpid liver and constipation; small doses at first, gradually increased (Wa). **Salophen**, is used with decided benefit in intestinal dyspepsia with flatulence. **Strontium Bromide**, is excellent in dyspepsia, also in acetic and lactic fermentations. **Glycozone**, is an excellent remedy for atonic and acid dyspepsias, in which it gives very gratifying results (Edson). **Aloes**, combined with other agents, where habitual constipation accompanies dyspepsia (R); especially indicated in duodenal dyspepsia, gr. ij–iv with Ipecac gr. j–ij two or three times a week (Wa). **Water**, a dry diet will entirely relieve the ice-water dyspepsia, or that due to excessive beer-drinking (B); half a tumbler of cold water ½ hour before breakfast acts to some people as a purgative and removes many dyspeptic symptoms, but flatulent dyspepsia is often traceable to excessive water drinking at meals, especially that of iced beverages (R). **Hot Water**, ½ a pint to a pint at 110°–150° F. an hour before each meal and ½ an hour before going to bed, each draught sipped slowly during 15–30 minutes; as a cure for dyspepsia this is an old and efficient practice (Wa). **Milk-cure**, has succeeded admirably (B); fresh Buttermilk a most excellent article for dyspeptics, as also is Kumyss. **Alcohol**, in any form, especially good wines, is useful in the atonic dyspepsia of sedentary livers (B); when loss of appetite and of digestive power from fatigue, a glass of wine or brandy-and-water before eating is very appropriate; useful also in indigestion of town-dwellers, or during convalescence from acute disease (R). Diet, avoid tea and hot beverages, over-cooked food, over-feeding and iced-water; masticate all food well, eat slowly, small quantities and frequently. Active out-of-door habits should be cultivated, and all articles of food known to disagree should be strictly avoided. [Compare ACIDITY, BILIOUSNESS, FLATULENCE, GASTRALGIA, PYROSIS.]

℞. Acidi Hydrochlor. Diluti, . ʒjss.
Glycerini, ... ℥ij.
Syr. Rubi Idæi, ... ℥jss.
Liq. Pepsini (Fairchild), . ℥iij.
Spt. Chloroformi, ... ʒss.
Vini Albi *vel* Xerici, q. s. *ad* ℥xij.
Sig.—℥ss thrice daily after meals.

℞. Ac. Hydrochlorici Dil., . ʒj.
Tinct. Capsici, ... ℥ss.
Tinct. Calumbæ, ... ℥jss.
Vini Pepsini, . . q. s. *ad* ℥iv.
M. Sig.—Dessertsp. after meals. In atonic dyspepsia. (*Pancoast.*)

℞. Tinct. Capsici, ... ♏xvj.
Tinct. Nucis Vom., . . . ʒij.
Tinct. Gentianæ Co., q. s. *ad* ℥ij.
M. Sig.—A teasp. in water thrice daily, with gr. $\frac{1}{5}$ of Aloin at bedtime, avoiding a starchy diet. For aggravated dyspepsia with constipation. (*Da Costa.*)

℞. Chloralis Hydratis, . . . ʒss–j.
Sodii Hyposulphitis, . . . ʒj.
Aquæ Menthæ Pip., . *ad* ℥iij.
M. Sig.—A teaspoonful in water after meals in nervous dyspepsia with severe gastric pain.

℞. Creosoti, ... ♏viij.
Bismuthi Subcarb., . . . ʒij.
Glycerini,
Aq. Menth. Pip., . . . āā ℥j.
M. Sig.—To be well shaken. A teasp. every 3, 4 or 6 hours, for pain in stomach and wind. (B.)

℞. Tinct. Nucis Vom., . . . ʒiij.
Ac. Hydrochlorici Dil., . ℥v.
Glycerini, ... ℥ij.
Aquæ Lauro-cerasi, . . . ʒj.
M. Sig.—Dessertsp. before meals, to improve appetite and digestion.

℞. Sodii Bicarb., ... ʒij.
Spt. Ammon. Aromat., . . ʒij.
Tinct. Zingib., ... ℥j.
Infusi Gentianæ Co., . *ad* ℥viij.
M. Sig.—Teasp. or two thrice daily. For acid dyspepsia.

℞. Rhei, Gentianæ, et Cardamomi, contus., . . . āā ʒij.
Spt. Vini Gallici, ... ℥ij.
Aquæ, ... ℥vj.
Macera per horas 48, cola et adde—
Tinct. Nucis Vomicæ,
Potassii Carbonatis, . . āā ʒj.
M. Sig.—Tablesp. in water thrice daily, before meals.

Dysphagia.

Cocaine, the Hydrochlorate in solution, 20 per cent., as spray or by swab, relieves the dysphagia of phthisical laryngitis (P). **Cajuput Oil**, in nervous dysphagia, used in India with considerable success (P). **Potassium Bromide,** for congenital dysphagia of liquids in children, when no diphtheria or malformation (R); in hysterical dysphagia (Wa); benefits a curious affection sometimes seen in children, who from their birth can swallow solids with ease but choke at liquids (R). **Sprays of Ammonium Bromide, Chlorine-water, or other sedative** agents in warm solution, for the dysphagia depending on specific disease of the larynx (Muirhead). **Galvanism,** in the vicinity of the esophagus will speedily remove hysterical dysphagia (Muirhead). **Tonics,** as **Strychnine, Iron and Quinine,** for post-diphtheritic dysphagia. **Iced Fluids, slowly swallowed,** will often remove spasmodic dysphagia (Wa).

Dyspnea.

Morphine, hypodermically, the most efficient agent in relieving dyspnea from cardiac disease, or any other form; but if albumin in the urine it must be withheld (Allbutt); controls dyspnea from any cause, more energetically than any other agent, giving the very power to breathe (Huchard). **Oxy-camphor,** in doses of gr. xv several times daily, is sedative to the respiratory centre like morphine without producing the injurious effects of the latter agent, and is an excellent remedy for many forms of severe dyspnea. **Grindelia,** of great service in dyspnea with cough, occurring in emphysema (W). **Cimicifuga,** has often relieved most distressing cases from cardiac disease (P). **Spigelia Anthelmia,** produces and often relieves it when with palpitations (P). **Valerian** has proved useful when nervous (P). **Prunus Virginiana,** has proved very efficacious in cardiac dyspnea (P). **Amyl Nitrite,** serviceable in cardiac dyspnea and other forms (Wa). **Asafœtida,** in combination with other antispasmodics, often very beneficial in dyspnea of chronic bronchitis (Wa). **Strychnine,** is a stimulant of the respiratory centre, and in small doses is useful for the dyspnea of pulmonary affections and that with cardiac palpitation in hysterical subjects. **Arsenic,** is efficient in the dyspnea of weak heart and in that of chronic bronchitis. **Ether,** in ʒ-doses internally, for uremic dyspnea (Whitla); seems to be of service only where there is much pulmonary engorgement [see under UREMIA]. **Chloroform,** a few whiffs give great relief in the cough and dyspnea of phthisis and bronchitis (Wa). **Ethyl Iodide,** by inhalation, is very serviceable in many forms (Sée). **Terpin Hydrate,** of especial value in asthmatic dyspnea, gr. ij every ¼ hour until gr. x are taken (Boyland). **Terebene,** for the dyspnea of chronic emphysema of the lungs; efficient in combating this symptom of various pulmonary affections. **Bleeding,** in a plethoric subject of pneumonia, with firm and incompressible pulse, suffering from dyspnea, or much pulmonary embarrassment and lividity, may be relied on to turn the scale in the patient's favor (Whitla). **Oxygen** inhalations, relieve the dyspnea of advanced phthisis and also the cardiac dyspnea connected with mitral disease (P). **Dyspnea** is a symptom, and may be due to cardiac, pulmonary, pharyngeal, laryngeal or tracheal disease (T). [Compare ANGINA PECTORIS, ASTHMA, BRONCHITIS, CROUP, EMPHYSEMA, PHTHISIS, etc.]

℞. Potassii Iodidi, ... ʒj.
Tinct. Lobeliæ, ... ℥iv
Syr. Sanguinariæ, . . . ℥j.
M. Sig.—A teasp. every hour.

℞. Liq. Morph. (Magendie), ʒj.
Spt. Ætheris Compos., . ℥ij.
Syr. et Aquæ, āā q. s. *ad* ℥iv.
M. Sig.—ʒj–ij thrice daily.

Dysuria.

Cantharis, gtt. j (sometimes v) of tincture ter die, for frequent micturition with pain (R); for irritable bladder, vesical tenesmus (B). **Cannabis Indica,** relieves dysuria (R); when bloody urine (P); an excellent anodyne in painful affections of the bladder, having specific action on that organ. **Belladonna** and **Hyoscyamus,** have similar sedative effects in vesical and urethral irritation (P). **Linseed,** as infusion, is often a valuable adjunct (P). **Opium,** in suppository, gr. ij combined with Hyoscyamus, gr. x, an excellent palliative (P); an enema of Laudanum or Morphine hypodermically to relieve the strangury caused by blisters (B). **Camphor,** is said to relieve strangury (R). **Chimaphila,** has undoubted power (P). **Squill,** often produces the best effects, especially a combination of the Acetum with Spt. Ætheris Nitrosi equal parts, of which ʒss in ℥ij of Anise-water, every hour or oftener (Wa). **Gelsemium,** a useful remedy

(B). **Ergot**, in paralytic dysuria, with sensation of bladder being imperfectly emptied (P). **Alkalies**, the Citrates, when dysuria from uric acid crystals in young male children (R). **Nitrous Ether**, Spt. Ætheris Nitrosi, ʒj–jss in any convenient vehicle, a popular and efficacious remedy (Wa). **Diluent Drinks**, freely, especially a decoction of Uva Ursi or of Cotton-root (P). [Compare Vesical Sedatives, Bladder Irritable, and Cystitis.]

Ear Affections.

Boric Acid, dry by insufflation, to destroy aspergillus in the external meatus; used after weak astringent injections, leeches, fomentations, etc., in general inflammatory conditions of the external ear (Whitla). **Sodium Bromide**, in large doses, gr. xxx ter die, gives some slight benefit in tinnitus aurium (Id). **Cocaine**, by instillation, sometimes gives considerable relief in tinnitus aurium, from its influence on arterial pressure (Id). **Water**, warm, by syringe, to remove wax and foreign bodies. **Olive Oil**, poured into the canal, to drive out insects or their larvæ. **Iodol**, renders good service in eczema of the ear; in moist, confluent eczema of the pinna, extending within the auditory canal, the surfaces should be thoroughly cleansed and the powder insufflated into the canal; in dry, external eczema it is best applied in the form of a Lanolin ointment. The inflammation disappears completely under this treatment in about 2 weeks, but irrigation should be kept up for a short time afterwards to complete the cure (Chatellier). [Compare Boils, Deafness, Otalgia, Otitis, Otorrhea, Vertigo.]

Ecchymosis.

Arnica, rapidly disperses, if administered shortly after injury, ♏v–x in water every two or three hours (P). **Alcohol**, diluted more or less, according to the amount of irritation present, is a good lotion (P). **Hamamelis**, the tincture diluted with 5 to 8 parts of water, as lotion, when much discoloration. **Ammonium Chloride**, in solution, as lotion on lint, or with bread or Linseed to form a poultice, in ecchymosis of the eyelids (Wa). **Capsicum**, the tincture or a strong infusion mixed with an equal bulk of mucilage or gum arabic and a few drops of glycerin added, painted on over the bruised surface, a second or third coating being applied as soon as the first is dry; there is nothing to compare with this treatment for a black eye. [Compare Bruises, Purpura.]

Ecthyma.

Quinine, cures, though in many subjects will cause it (B); when due to malnutrition (R). **Lead**, the Liquor Plumbi Subacet., ʒj ad Oj aquæ, a soothing application (Wa). **Zinc Oxide**, the Glycerite with a little Camphor, an excellent application (Wa). **Cod-liver Oil**, internally and locally (B). **Grape-cure**, often happily modifies (P). **Borax**, a solution in rose or elder flower water (Wa). **Chlorinated Lime**, a solution as a lotion (Wilson). **Chrysarobin**, internally, half-grain doses, in wafer or pill, given with good results (Stocquart).

Ectropion and Entropion.

Silver Nitrate, freely to the exposed surface, in ectropion of lower lid due to hypertrophy of conjunctiva after inflammation (C). **Collodion**, successfully used in entropion to restore position of the lid by its contraction; should be concentrated (Wa). **Faradization**, in paralytic ectropion (C). **Operative Measures**, of great variety, are in use, Arlt's being the best for bad cases of the upper lid (Roosa). **Epilation** of lashes gives temporary relief in entropion.

Eczema.

Arsenic, ♏v of Fowler's solution thrice daily on a full stomach, gradually diminishing the dose, in the chronic type (B); especially in eczema of vulva, anus and scrotum (R); small doses for acute, full doses for chronic form; the urine to be closely watched and the drug discontinued on the least sign of renal irritation (Pf). **Sodium Arsenate,** hypodermically into an eczematous patch, to change the indolent form into an active one (Pf): Arsenic rarely does any good and often irritates (Hutchinson). **Tar,** internally, the Pix Liquida in doses of gr. ij–v thrice daily, when Arsenic fails to relieve or is contraindicated; locally in third stage when redness, drying and scaling; Oleum Cadini when genuine is the best form of tar, mixed with simple ointment, ʒss–j to the ℥: Ol. Rusci or Pix Liquida may be used (Pf): Tar is the chief local remedy for eczema and is specific for all forms, next in order of value being Lead and Mercury; it should be employed in weaker solutions than are usual, the best being the alcoholic solution of coal tar named Liquor Carbonis Detergens, ʒj to the pint of water, used freely (Jonathan Hutchinson): Tar should never be used in the moist stage, but only after the acute inflammatory symptoms have subsided, and then cautiously; a useful combination, and one less likely than tar ointments to cause irritation, is Ol. Cadini, ʒj–iij, Ol. Amygd. Dulc., q. s. ad ℥j, brushed lightly over the diseased surface. **Lead,** soluble salts as lotions when much inflammation and discharge (R); also in early vesicular and pustular conditions; Diachylon ointment comes next in efficiency to mercurial ointments (Pf). **Zinc,** the Oxide and Carbonate as dusting powders (R); the Sulphate with Alum, Glycerin and Rose-water, an excellent lotion (B); the Oxide is not curative, but as a protective is the best ointment, when freshly and well made, for use over a large surface (Pf). **Lime-water,** as sedative application and to check discharge; after inflammation is subdued, Lime-water and Glycerin (R); mixed with Carron Oil a very good application in acute eczema. **Mercury,** as black and yellow washes in early vesicular and pustular conditions; mercurial ointments are the most efficient of the local applications, especially those of White Precipitate, Nitrate, mild Chloride, and Black Oxide; ointments of the Biniodide or Bichloride as irritating application in chronic indolent form (Pf); Brown Citrine Ointment nightly in eczema of the margin of the eyelids after detaching scales (B); very useful when eczema on hairy parts of face; often is best mixed with a tar ointment (R). **Carbolic Acid,** externally and internally in chronic forms (B); is analogous to Tar, and suitable to the same types of the affection as the latter is (Pf). **Phytolacca** has cured obstinate cases (B). **Graphite,** in ointment, 1 to 10, or with some inert powder, as Lycopodium or precipitated Calcium Phosphate, in fissured eczema, especially that of the hands and behind the ears (Pf). **Bismuth,** the Subnitrate or Subcarbonate locally (R); the Subgallate (Dermatol) has proven very useful in the treatment of moist eczema. **Zinc Salts,** the Oxide and Carbonate as dusting powder, or the Sulphate, etc., in astringent ointments (Bulkley). **Buckwheat Flour,** one of the best dressings; a limb may be enveloped in a bag filled with the flour (Bulkley). **Salicylic Acid,** locally, in eczema of hands and feet has been very successful (B); in plaster is of very great value, and becoming more recognized (Unna, Pick); the best form is a salicylated soap-plaster (formula on next page). **Salol,** as an antiseptic powder, has done good service. **Belladonna,** gr. ¼ of extract with gr. iij of Quinine Sulphate thrice daily in eczema of the hand, with Bismuth Subcarbonate as a dusting powder (B). **Aristol,** is an excellent application.

Conium, the tincture may be added to one of the ointments for the pruritus, which is usually very obstinate; so also Stramonium or crude Petroleum (Pf). **Hamamelis,** locally as antipruritic, and in chronic eczema marked by decided venous retardation (Pf). **Benzoin,** to allay itching, the compound tincture painted on the skin (R). **Ichthyol,** a promptly efficient remedy. **Thiol,** may well replace Ichthyol; the dry form as a dusting powder has been used with remarkable benefit. **Anacardium Orientale** (Oil of Cashew), as ointment in patches of indolent chronic eczema (Pf). **Iris Versicolor**, in chronic eczema of gouty patients invaluable as a hepatic stimulant, ♏v–x of tincture from the fresh root twice daily (P). **Rhus Tox.**, externally and internally, when burning and itching, quickly subdues in some cases (P); in chronic form with rheumatism, worse at night-time; also in acute cases if given at the very beginning, ♏$\frac{1}{100}$ of a good tincture is dose enough to begin with (Pf). **Phosphorus**, of undoubted service in eczema of long standing, probably acts as a hepatic stimulant, gr. $\frac{1}{100}$ to $\frac{1}{25}$ in oil or reliable pill (Pf). **Viola Tricolor**, an infusion the best form, with purgative doses of Senna for a few days then alone, in eczema of the head and face; gives prompt results (good or bad); often aggravates, which though good in chronic forms must be avoided in acute types (Pf). **Calcium Sulphide**, gr. $\frac{1}{100}$ to $\frac{1}{25}$ in acute and chronic cases of pustular character, the impetigo of old writers; small doses in acute form, larger ones in chronic cases (Pf). **Sulphur**, internally and Sulphides as baths, but not in the acute stage (R); solution of Potassium Sulphide in water locally (B). **Liquor Potassæ**, or a stronger solution of Potash, to infiltrated patch of chronic eczema, before attempting to heal it (Pf). **Croton Tiglium**, the seeds bruised in alcohol, as liniment (Wa); the Oil as basis of stimulating applications in the chronic form (Pf). **Glycerite of Tannin**, locally (R). **Potassium Iodide**, is often efficient where a syphilitic history or inheritance can be traced. **Glycerin**, locally at night when caustic lotions have been used (R). **Electricity** has cured obstinate cases (B). **Thyroid Extract**, has been used with benefit (see page 158). **Water**, locally is injurious, unless its sp. gr. approaches that of the blood serum; Rose-water with a little Glycerin and Sodium Chloride when ablution necessary in second stage, that of exudation and crusting (Pf). **Soaps**, Petroleum, Cade or Carbolic (R); Sapo Viridis, to soften up infiltrated patches of chronic form, instead of the potash solutions mentioned above (Pf). **Chaulmoogra Oil**, in old cases is often of great benefit, as an ointment (Wa). **Oil of Cajuput**, put up by mistake of druggist for Oil of Cade, made a remarkable cure in a case which had resisted treatment for some time (Claiborne). **Diet** should be largely vegetable, especially vegetables which are eaten raw; Cod-liver oil as a supplemental article of diet. Milk diet when acid indigestion present (B).

℞. Violæ Tricolor, ... ℥j.
Sennæ, ... ʒss.
M. Fiant chartulæ no. iv.
Sig.—Make an infusion with hot water from each paper, and take every night.
(*Piffard.*)

℞. Vini Ferri Amari, ... ℥jss.
Syrupi Tolutani, ... ʒiij.
Liq. Potass. Arsenit., . . ʒj.
Aquæ Anethi, ... ℥ij.
M. Sig.—A teasp. to a dessertsp. thrice daily. (*Wilson.*)

℞. Potassii Citratis, ... ʒij.
Liq. Potassii Arsenit., . . ʒj–ij.
Tinct. Nucis Vom., . . . ℥ij.
Tinct. Cinchon. Comp., *ad* ℥iv.
M. Sig.—A teasp. in water, after meals, as a tonic and alterative. (*Bulkley.*)

℞. Emplas. Diachyli Simplicis,
Emplas. Saponat., . . āā p. xl.
Petrolati, ... p. xv.
Acidi Salicylici, ... p. v.
Sig.—Emplas. Salicyl. Compos. (*Pick.*)

℞. Acidi Salicylici, ... ʒj.
Zinci Oxidi, ... ʒiij.
Pulveris Amyli, ... ℥iv.
Adipis Lanæ Hydrosi, . . ʒj.
M. Fiat unguentum. Sig.—Apply daily as a paste for eczema. (*Practitioner.*)

℞. Hydrarg. Ammoniat., . . gr. xv.
Glyceriti Amyli, ... ℥j.
M. Fiat unguentum. (*Müller.*)

℞. Olei Cadini,
Zinci Oxidi, ... āā ℥ss–j.
Ung. Aquæ Rosæ, ... ℥j.
M. Sig.—Ointment. Antipruritic and mildly astringent. (*Bulkley.*)

℞. Picis Liquidæ,
Pulv. Sem. Anisi, . . . aa ʒ ijss.
Magnesiæ Calcin., . . . q. s.
M. Ft. pil. no. c. Sig.—Two to ten pills daily. (*Miguet.*)

℞. Ol. Cadini, ... ℥ss.
Glycerini, ... ʒj.
Ung. Diachyli, ... ℥ijss.
M. Ft. unguentum. In squamous eczema with thickened skin. (*Fox.*)

Emaciation.

Calcium Phosphate, is especially useful in chronic wasting disease (R). **Arsenic**, is used by cattle-breeders to fatten oxen, etc., quickly (Tr). **Iodine**, improves the appetite and digestion, and gives strength and plumpness to the body (Wa). **Cinchona**, in small doses improves the appetite and the general tone (Wa). **Iron Salts**, cause marked gain in flesh and color (Wa); remarkably promote the appetite and digestion (B). **Cod-liver Oil**, internally and externally with friction, often very effective in the malnutrition and marasmus of children (P). **Olive Oil**, by friction daily; inunctions are of value in many wasting diseases (P). **Pepsin**, to promote digestion of food (P). [Compare APPETITE, ATROPHY, PHTHISIS, TABES MESENTERICA.]

Emissions and Erections.

Hyoscine, the Hydrobromate in pill, gr. $\frac{1}{120}$ to $\frac{1}{80}$ at bed-time, will always check seminal emissions (W). **Belladonna**, when emissions, genitalia relaxed, atonic state (B); in gradually increasing doses produces good results, even in extreme cases of emissions (Wa). **Camphor**, fails as often as it succeeds (P). **Potassium Bromide**, exercises special influence as a sedative in irritable states of the genito-urinary organs (Wa). **Cimicifuga**, as tonic to the nervous system, removes irritation and melancholy, produces sound and refreshing sleep (Wa). **Lupulin**, useful to check emissions (P); gr. v–x or xv to keep penis at rest (Wa). **Ruta**, in small doses to limit discharge (P). **Chloral**, at bed-time, repeated every night until the habit is broken off (Wa). **Iron**, the tincture of the Chloride in ʒ doses at bed-time, sometimes conquers nocturnal emissions (Wa). **Cocaine**, a few drops of a 4 per cent. solution upon the glans penis, promptly controls an erection. [Compare CHORDEE, SPERMATORRHEA, and the List of Anaphrodisiacs on page 31.]

Emphysema of the Lungs.

Morphine, gr. $\frac{1}{6}$, and **Atropine**, gr. $\frac{1}{120}$, hypodermically for the asthmatic attacks; no remedy so efficient; the disease being incurable treatment must be chiefly palliative (B). **Potassium Iodide**, in full doses alone or combined with the Bromide, affords most relief next to Morphine (B). **Strychnine**, is a valuable respiratory stimulant; useful where there is constant dyspnea with prolonged expiration (Wa). **Stramonium**, the leaves smoked for the asthma and dyspnea before retiring, will often give a good night's rest (Wa). **Ammonium Iodide**, with Arsenic for the bronchitis, with Copaiba, Turpentine or Eucalyptol, continued for some time (B). **Digitalis**, or hydragogue cathartics as Pulvis Jalapæ Comp., for the dropsy (Da C). **Arsenic**, when emphysema is connected with recession of a rash, is useful (R); long continued it ameliorates (B). **Terebene**, gives good results on the dyspnea. **Lobelia**, allays the dyspnea which accompanies capillary bronchitis in emphysema (R). **Senega**, often acts beneficially (P). **Cod-liver Oil**, continued for a long time (R). **Hypophosphites**, are useful (B). **Chalybeates**, the Phosphate of Iron, Quinine and Strychnine (B). **Grindelia**, for asthmatic breathing and bronchitis (B); of great service (Wa). **Chloral**, for the short breath of such patients brought on by catching cold; if obstructed circulation caution required (R). **Bleeding and Purging**, have been used with great success in many emphysematous conditions (R). **Breathing into Rarefied Air**, the only scientific remedy yet brought forward for this affection, affording much relief which is sometimes permanent. The Waldenberg-Schlitzner apparatus is the best for this purpose. When there is co-existing bronchial catarrh it is necessary to precede the expiration into rarefied air by inspiration of compressed air, else irritative cough is excited (Y). [Compare ASTHMA, BRONCHITIS, DYSPNEA.]

℞. Potassii Iodidi, ... ʒ iij.
Strychninæ Sulph., . . . gr. j.
Liq. Potassii Arsenit., . . ℥ ijss.
Aquæ Laurocerasi, q. s. *ad* ℥ iv.
M. Sig.—Teasp. 4 times daily. For relief of dyspnea, toning the cardiac action, removing the bronchial catarrh, and preventing the progress. (*Hughes.*)

℞. Potassii Chlorat.,
Tinct. Belladon., . . . āā ʒ jss.
Ext. Pruni Virgin. Fluidi,
Tinct. Cinchonæ Comp., āā ℥ ij.
M. Sig.—A dessertsp. 4 times a day, when chronic bronchitis and anorexia. Dry cups also to chest night and morning. (*Da Costa.*)

Empyema.

Carbolic Acid, a weak solution to be injected after evacuating the pus (R); Carbolate of Iodine has been injected with benefit (B). **Iodine**, in solution to be injected after tapping (R); the undiluted tincture may be thrown in without risk and with great benefit; or the compound solution ℥j to ℥xv aquæ, as wash for the cavity to prevent re-formation of pus (B). **Chlorine Water**, or a solution of Quinine, to wash out the cavity (R). **Salicylic Acid**, in solution, answers well for the same purpose (P). **Ammonium Acetate**, the official Liquor Ferri et Ammonii Acetatis, with Quinine and stimulants, if the affection shows a tendency to linger (Da C).

Endocarditis.

Aconite, should be given early in all inflammations of serous membranes (Wa); gtt. ½ or less, frequently (R); it is rare to meet with permanent organic heart disease as a result of rheumatic fever when the disorder is treated with Aconite from its commencement (P). **Spigelia Anthelmia**, is very useful in rheumatic endocarditis (P). **Opium**, in inflammation of serous membranes (B). **Digitalis**, to control the circulation, especially where irregular heart action (Da C). **Veratrum Viride**, has been used with remarkable effect on the pulse (Wa). **Alkalies**, as Potassium or Ammonium Carbonate, freely until urine is alkaline, to prevent permanent changes about the valves or orifices (Da C). **Potassium Iodide**, to promote absorption of the exuded lymph. **Quinine**, at the onset, may check the inflammation (B). **Salicylic Acid**, is useful in the rheumatic form (P). **Iron**, the tincture of the Chloride with alkalies, if pyemic symptoms are manifested (Da C). **Rest** for some days after active signs have abated, with agents to lower the blood-pressure within the heart and vessels (Fothergill). **Leeching**, in the stage of acute inflammation is to be recommended if done early, later is useless; use cups if no leeches are at hand (Da C). **Poultices**, give great relief and are of decided benefit (Id). **Stimulants**, as Ammonium Carbonate, etc., freely, if signs of oppressed circulation appear (Id). [Compare PERICARDITIS.]

Endometritis.

Carbolic Acid, undiluted, on cotton-wrapped probe; no better method of treating uterine catarrh (B). **Iodine**, the most valuable of all local remedies (E); Churchill's tincture (Iod. gr. 75, Pot. Iod. gr. 90, Alcohol ℥j), one of the most useful applications to the endometrium (Mundé). **Iodized Phenol** (Iodine j, Ac. Carbol. iv), on cotton-wound probes, applied to the uterine cavity, has iven the best results of any agent used for years past (Battey). **Chromic**

Acid, as caustic, when slough is required; should only be used after dilatation of cervical canal, and at the patient's home (Mundé); a solution of gr. xv to ʒj of hot water applied with success to the uterine cavity for catarrh (Wooster). **Nitric Acid**, fuming, to uterine cavity through intra-uterine speculum (Atthill); is considered by many the one agent for all forms of intra-uterine medication; is efficient and comparatively safe but produces too much cicatricial tissue (Mundé). **Iodoform**, as suppository in rectum (B); in pencils to uterine canal. **Iodo-tannin**, locally in chronic cases (B). **Ergot**, or better **Ergotin**, gr. j, subcutaneously, for the train of uterine disorders depending on passive congestion of the organ (P). [See HYSTERIA for formula.] **Glycerin**, as a local application, introduced by Sims, is of great value; especially as vehicle for impure Carbolic Acid or Iodine, on cotton or oakum (E). **Hot Water** injections in large quantity about the os uteri, are of great value (E); as usually made are of no value; must be applied by special syringe, in the dorsal recumbent posture with elevated hips, at a temperature of 100° to 120° F. twice daily for at least 20 minutes each time, and persevered in for months and years (Mundé). [Compare UTERINE CONGESTION and HYPERTROPHY.]

℞. Potassii Iodidi,
Potassii Bromidi, . . . āā gr. xx.
Tinct. Iodi, ... ʒ ss.
Aquæ, ... ʒ ij.
M. For hypodermic injection into cervix, in chronic cervical metritis. (*Bennett.*)

℞. Ergotini, ... gr. xx.
Tinct. Iodi, ... ʒj.
Glycerini, ... q.s. *ad* ℥j.
M. Sig.—Apply twice daily with camel's-hair brush, in cervical metritis.
(*Dabney.*)

Enemata.

Enemata, for an infant, ℥ss–j; child of 2 to 5 years, ℥ij–vj; 5 to 15 years, ℥vj–Oj; adult, Oj–quart j. A simple domestic enema consists of soapsuds with a little common salt, or a pint of cold water (B). Simple warm water or gruel sometimes; or to one or the other of these add Soap, Turpentine or Castor Oil, with soap or gruel to suspend the two latter. Very cold water may be used without inconvenience. Starch, boiled or raw, of cream consistence, temperature 100°, with a few drops of Tinct. Opii, in extreme cases of choleraic diarrhea, or that of phthisis or typhoid fever (R). **Nutrient Enemata**, should contain materials for artificial digestion, as the rectum is not an organ of digestion, and to secure rapid osmosis should have an acid reaction. A suitable formula is appended below. Inject slowly and not frequently; five times in twenty-four hours should be the maximum. Defibrinated blood has also been used as a rectal injection with good results, being completely absorbed (B). Enemata should not exceed three or four ounces of bland material, injected slowly, after ascertaining that the rectum is not filled with feces (R). [Compare the subtitle INJECTIONES, *ante*, page 577.]

Nutrient Enema.

℞. Infusi Carnis (Beef-tea), . ℥ iv.
Acidi Hydrochlorici, . . . ♏x.
Glyceriti Pepsini (Scheffer), ʒ ij.
If rectum irritable add 10 to 20 drops of Laudanum.

Enema Ricini et Terebinthinæ.

℞. Ol. Ricini, ... ℥jss.
Ol. Terebinth., ... ℥ ss.
Ovum, ... j.
Decocti Hordei, *vel*
Aq. Fervid., ... ℥ xiv.

Enteritis.

Opium, to the point of tolerance, is *the* remedy, the deodorized tincture in 10-drop doses every second or third hour, according to age (Da C); of great value to control inflammation and quiet the intestines (B); proves of signal use (Wa). **Aconite**, of great utility in acute inflammation with high temperature, sthenic condition, resisting pulse (R). **Arsenic**, surprisingly curative; small doses with Opium (B). **Podophyllum**, with occasional doses of Aconite, will often allay the vomiting and diarrhea (P). **Ricinus Communis**, is employed with great advantage (P). **Lime-water**, in mucous enteritis. **Turpentine** stupes, hot, over seat of disease, are of advantage (Wa). **Skim-milk**, is of the highest value as sole diet in acute inflammation of digestive organs (B). **Poultices**, Linseed, large and hot (Wa); may be used or not, as the patient feels benefit from them or otherwise (Da C). **Water**, hot fomentations, followed by a wet compress; cold and hot, principally cold, or ice, of unquestionable advantage (B). Ice or cold water freely swallowed. Perfect quiet in bed. **Diet**, no food until inflammation subsides, then beef-tea, milk, gum-water, etc., the very mildest and most bland diet for four or five days (Da C). [Compare CHOLERA, DIARRHEA, DYSENTERY, PERITONITIS, TYPHLITIS.]

Enuresis.

Belladonna, no single remedy so uniformly successful; children require large doses; small doses are useless (P); a solution of Atropine best, gr. $\frac{1}{120}$ to $\frac{1}{60}$ (B); the best remedy for children, gtt. x–xx of the tinct. three times a day; if unsuccessful and no worms or other irritation exist, try Strychnine, Cantharides, Turpentine, Santonin or Galvanism (R). **Santonin**, in over-doses produces incontinence of urine in children, but curiously will sometimes stay the habit, even when not dependent on worms and in cases where Belladonna fails (R); in the enuresis from worms (P). **Cantharides**, one or two drops of the tinct. three or four times a day in middle-aged women or the aged, even when due to paralysis; sometimes also in children, but for them Belladonna is generally better (R). **Chloral Hydrate**, enuresis in children (R); three-grain doses thrice daily for infantile incontinence (Da C). **Strychnine**, may succeed when the above remedies fail (B); sometimes useful for old people with paralysis of bladder, also for children (R). **Quinine**, in full doses, does good service in cases where chorea exists (Potts). **Buchu**, often successful in chronic enuresis (P). **Turpentine**, small doses sometimes remove the trouble (B). **Lupulin**, said to be useful; Herzfelder used it with advantage. **Rhus Aromatica**, has proven curative in 75 per cent. of cases treated with it and of great benefit in the other 25 per cent.; the fluid extract, ♏x–xv four times daily in glycerin and water (Stein). **Scutellaria**, remarkably efficient in many instances, ʒj of the fluid extract thrice daily for a child 12 years old. **Potassium Nitrate**, has been recommended for children (R). **Potassium Bromide**, succeeds in some cases (Wa). **Collodion**, painted to form a cap over end of prepuce (R). **Ergot**, when from paralytic state of sphincter (B); said to be useful (R). **Iron Iodide**, the syrup ♏xv–xx, well diluted with water, ter die, in pale, delicate, strumous children (B); sometimes useful even when no worms (R). **Habits**, children to be taught to retain water as long as possible during the day, little salt to be eaten, abstinence from fluids not necessary, bland fluids diminish acridity of the urine. Removing meat from the diet has cured several cases permanently, after all remedies had been tried without success.

℞. Strychninæ Sulph., . . gr. j.
Pulv. Cantharidis, . . . gr. ij.
Morphinæ Sulph., . . . gr. jss.
Ferri Reducti, ... gr. xx.
Ft. pil. no. xl. Sig.—One thrice daily for a child of 10 years. (*Gross.*)

℞. Tinct. Ferri Chloridi, . . ʒij.
Ext. Ergotæ Fluidi, . . ʒv.
Spt. Chloroformi, . . . ʒij.
Tinct. Quassiæ, q. s. *ad* ℥iv.
M. Sig.—A teasp. in a winegl. of water thrice daily for children

Epididymitis.

Aconite, alternately with **Pulsatilla**, the latter in very small doses, a few drops of tinct. in a glass of water, a teasp. every 2 or 3 hours, produces the happiest effects (Pf, St). **Belladonna**, the extract, ʒj–ij ad ℥j of glycerin and water, on lint, applied to the inflamed testicle (Bumstead). **Tobacco,** with Linseed meal, as poultice, cautiously! (P). **Mercury** and **Morphine**, locally, a 20 per cent. oleate by inunction, in cases of syphilitic origin (R). **Silver Nitrate,** gr. lxxx ad ℥iv aquæ destil. freely applied to the scrotum will sometimes abort an epididymitis (Wa). **Strapping** and suspensory bandage to support the testicle, also rest in the recumbent posture from the beginning, with a saline cathartic to clear the bowels, are all measures of great importance (Bumstead). [Compare ORCHITIS.]

Epilepsy.

Bromides, should be first employed in all cases, there being no remedy equal to large doses of Bromine salts, which should be persistently continued for many months, and with short periods of rest may be kept up for years; the combination mixture of Bromides has been taken by patients for 8 to 10 years without harm (Brown-Séquard); Bromides taken for long periods without a physician's supervision have caused profound muscular depression, mental alienation and death (Hammond). **Potassium Bromide,** gr. xl ter die before meals, double dose at bedtime, for two or more years after all epileptic indications have ceased; is generally useful, especially in daytime seizures and *grand mal* of sexual origin; also for infantile convulsions (B); especially in convulsive form, but often powerless (R). **Sodium Bromide,** gr. xx ter die, will arrest epilepsy without producing the cerebral symptoms of bromism (Clymer). **Lithium Bromide,** ʒss daily, acts in some cases after Pot. Brom. has failed, and is generally efficient in about one-half the dose of the latter salt (Weir Mitchell). **Nickel Bromide,** gr. v thrice daily is remarkably efficient in the epilepsy occurring at the menstrual epoch, and cases which have withstood the action of the other bromides (Da C). **Ferrum Bromide,** will often cure cases in weak and anemic subjects; also with Potassium Bromide to combat the anemia and depression produced by the latter (B). **Ammonium Bromide,** preferred in *petit mal* by many authorities; combined with other bromides, as in Brown-Séquard's mixture (see formula on p. 693), before meals, with Strychnine or Arsenic and a vegetable bitter after meals; in combination with Antipyrin (see next page) is efficient (W). **Zinc Bromide,** gr. v in water and glycerin four times daily; may be combined with the other bromides. **Strontium Bromide,** in doses of gr. xx thrice daily, gradually increased; has been beneficially used as an alternate, being much less liable than the others to produce bromism (Sée); should be given in 30-grain doses, and combined with a dose of Physostigmine, when its effect on epilepsy is very marked (Stanley); both the Strontium and Calcium Bromides may be used with benefit (Féré). **Aurum Bromide,** is highly efficient in doses of gr. ⅛ to ½ (see page 209); Aurum and Arsenic Bromide, the solution in 5-minim doses thrice daily, increased to 10 minims, gave very satisfactory results in a severe case in a boy aged 7½ years (Barclay).

Opium, a valuable adjunct to the Bromide treatment, a prolonged treatment by opium rendering the organism extremely susceptible to the action of bromides; for 6 weeks ascending doses beginning with 1 grain, up to a daily dosage of 15 grains or more; then suddenly stopped and replaced by 30-grain doses of Potassium Bromide four times daily, produced instantaneous effect on cases in which all other medication for several years had failed (Flechsig). Digitalis, Belladonna or Physostigma, in combination with bromides give better results than the latter alone (Poulet); Digitalis is valuable in *petit mal* and in nocturnal epilepsy (Da C), a good addition to the bromides when there is cardiac weakness (Huchard); 10-minim doses of the tincture with 20 grains of Potassium Bromide thrice daily, in cases complicated with cardiac dilatation (Gowers). **Belladonna,** for *petit mal* and nocturnal epilepsy, in pale and anemic subjects, should be given for a year or more; extract and leaves, gr. ⅕ of each in pill, every day at same hour, one additional pill every month (Tr); useful, especially when from fright (P). **Atropine** better, drop-doses of a 1 per cent.

solution of the neutral sulphate in white brandy (Tr). **Arsenic**, in epileptiform vertigo from stomach disorder (B); sometimes useful (R); the Bromide of Gold and Arsenic (see *ante*). **Sodium Borate**, in doses of gr. xx 3 or 4 times a day, has produced very good results in nocturnal epilepsy; is of real value and better than Bromides in symptomatic epilepsy, may also be found useful in nervous forms after the bromides have failed (Mairet); if begun with small doses may be gradually increased to 90 grains a day; when dose exceeds 60 grains daily it is advisable to add glycerin to the water and syrup used as excipients (Dijoud); excellent results obtained from a combination of Borax with Bromides, especially Sodium Bromide (Alexander); in most cases the disadvantages of this drug more than counterbalance the slight benefits resulting therefrom (Féré); for cases in which Borax acts best, and for the results of Borism see page 82. **Physostigma** used in 12 cases, of which 6 were improved, and in the others a notable increase took place in the number of the paroxysms (Williams). **Chloral**, a valuable auxiliary in troublesome cases with tendency to insomnia, violent convulsions or maniacal excitement; should be given in the evening, combined with bromides and used with caution when cardiac debility (Y); in full doses at night the most suitable remedy for the nocturnal variety (B). **Antipyrin** in combination with Ammonium Bromide (gr. vj with gr. xx) has proved very efficient, alleviating some quite hopeless cases (W); is a real gain in the management of epilepsy (Y); Potts has published a report of 43 cases treated with this combination. **Acetanilid**, of great value where bromides fail, in four such cases it produced definite cures in doses of 7½ grains in cachets thrice daily (Dujardin-Beaumetz); of very uncertain action (Y); is most useful in the diurnal form and in cases of full habit, active circulation, red face, and injected eyes (B).

Amyl Nitrite, inhaled at the beginning of the aura will prevent an attack (B); or ♏ij-v in mucilage, when fits are very frequent (R). **Nitro-glycerin**, ♏$\frac{1}{100}$, slower in action than Amyl Nitrite, but more enduring (Pf). **Chloroform**, by inhalation during paroxysm and also in intervals (Wa); is of high value especially in cases of an hysterical character (Brown-Séquard); Anesthetics are rarely called for (W). **Amylene Hydrate**, in 10 per cent. solution, of which a tablesp. or two (gr. 30 to 90) a day, of value in *petit mal* and nocturnal epilepsy, also when bromides have failed, and where the attacks are not only very frequent but severe (Nache). **Hydrastinine**, has been used with benefit, in doses of gr. ¼ to gr. ½ of the Hydrochlorate, up to gr. ij daily [illegible]y. **Picrotoxin**, anemic subjects, attacks occurring at night, $\frac{1}{60}$ to $\frac{1}{20}$ of a grain in hypodermically, or $\frac{1}{30}$ to $\frac{1}{15}$ by stomach (B); benefits cases resulting from onanism (P). **Cannabis Indica**, has given good results; is suitable for *petit mal*, the nocturnal variety, and with Strychnine, Belladonna, or Picrotoxin in for cases characterized by anemia and depression (B). **Quinine**, when of malarial origin (P); often useful in intermittent epilepsy (Ros). **Ignatia**, i[illegible] in convulsions unattended with cerebral congestion (P); is *par excellence* the controller of functional phenomena of the cerebro-spinal axis (Pf). **Strychnin**[illegible]ne, is useful in idiopathic epilepsy, but injurious in symptomatic form; benefits whe[illegible]en Potassium Bromide fails; when cerebral anemia, nocturnal attacks (S, Pf); [illegible] if bromides fail and case is anemic, give Strychnine, gr. $\frac{1}{30}$ ter die, and push [illegible]h it (B). **Silver Nitrate**, is not without efficacy, and was formerly much used, but the danger of staining the skin has caused its disuse, especially as better agents have been found (Wa). **Copper Salts**, may be useful in cases originating from the stomach; were formerly much used (B); the Nitrate or Oxide often given with benefit (R); the Ammonio-sulphate, gr. ¼ in pill, thrice daily to begin with; should not be continued beyond 3 or 4 months at a time (Brown-Séquard). **Zinc Salts**, have been much used in place of silver and copper salts, not having the serious drawbacks attending the latter agents; the Oxide is probably useful only in cases originating from the stomach; much said for and against it (R); the Citrate and the Lactate are preferred by many, as less likely to cause stomach derangement (Y). **Orchitic Extract**, also **Spermine**, have been used with benefit (see pages 163, 164). **Turpentine**, has long been used, when due to reflex impression of intestinal parasites (B). **Conium**, not equal to the bromides (B); not of much value (P). **Valerian**, has been used with some advantage (R). **Bryonia**, has an ancient reputation (P). **Rue**, may benefit when seminal emissions (P). **Solanum Carolinense** (the Horse-nettle), in tincture of the berries, made by bruising them and steeping in whiskey, has quite a reputation among the negroes for epilepsy and other convulsive affections, and has rendered good service in my hands (Napier). **Fats and Oils**, especially cod-liver oil when faulty assimilation exists (B). **Galvanism**, only in idiopathic epilepsy (B). **Meat Diet**, in many cases must be prohibited entirely. **Trephining** the skull, has given good results in several cases where a distinct impression from injury existed; in others where apparently indicated it has been of no service. [Compare CONVULSIONS.]

℞. Potassii Bromidi, ... ℥j.
Ferri Bromidi, ... gr. iv.
Aquæ, ... ℥ij.
Syrupi Simplicis, ... ℥vj.
M. Sig.—A tablesp. twice daily.

℞. Strychninæ Sulphatis, . . gr. j.
Acidi Sulphurici Dil., . . ♏x.
Aquæ Destil., ... ℥iv.
M. Sig.—A teasp. gradually increased to a dessertsp. after each meal.

℞. Potassii Bromidi,
Sodii Bromidi, ... āā ℥ss.
Liq. Potas. Arsenitis, . . ʒss.
Ext. Conii Fl., ... ♏l.
Aquæ Cinnamomi, . . . ℥ij.
Infus. Gentian. Co., q.s. *ad* ℥viij.
M. Sig.—One tablesp. two hours after each meal.

℞. Potassii Bromidi,
Sodii Bromidi,
Ammonii Bromidi, . . āā ʒiij.
Potassii Iodidi,
Ammonii Iodidi, . . . āā ʒjss.
Ammonii Carbonat., . . ʒj.
Tinct. Calumbæ, ... ℥jss.
Aquæ, ... q. s. *ad* ℥viij.
M. Sig.—A teasp. and a half before each meal, and three teasp. at bed-time.
(*Brown-Séquard.*)

℞. Potassii Bromidi,
Ammonii Brom., . . . āā ℥ij.
Ext. Ergotæ Fl., ... ℥j.
Aq. Cinnamomi, . q. s. *ad* ℥viij.
M. Sig.—A dessertsp. in water thrice daily. When maniacal excitement and danger of cerebral hemorrhage. (*Smith.*)

Epistaxis.

Aconite, has been used with the best results (P); small frequent doses quickly check epistaxis in children and plethoric people (R). **Antipyrin**, has been highly efficient; in 5 to 15 per cent. solution as a local hemostatic, it will arrest almost any nasal hemorrhage (Huchard). **Adrenal Extract**, used both locally and internally, is very efficient [see page 165]. **Gelatin**, 5 parts dissolved in 95 of normal salt solution and sterilized by boiling at a temperature not above 239° F., is a promptly styptic application (Carnot). **Arnica**, internally, is of great service in epistaxis from mechanical violence (P). **Belladonna**, when the bleeding is of congestive origin (P). **Ipecacuanha**, has been highly praised (R); acts upon the vessels (B); gr. j–ij every quarter hour until nausea is felt, but vomiting need not be excited (Wa). **Hamamelis**, venous hemorrhage (Pf). **Ergot**, ʒss–ʒj of fresh powdered Ergot, or ʒj–ʒij of flu. ext. every half hour or hour, necessary in urgent cases (B). **Alum**, injected or snuffed up in powder (R). **Iron Spray**, in obstinate cases Liq. Ferri Subsulph., ʒj to ℥viij aquæ by spray or injection; the tinct. of the Chloride also useful (B); diluted ʒij in ℥vj injected into the nostrils is often effectual (Wa). **Tannin**, finely powdered, blown into the nostrils through a quill (Wa); a strong solution, ʒij ad ℥iv, by nasal syringe (B). **Turpentine**, may be given internally with advantage (Wa); especially in debilitated conditions (B). **Lead Acetate**, gr. ij–iv with Opium gr. ss–j, proves signally useful (Wa). **Vinegar**, on lint introduced into the nostrils, sometimes highly efficient (Wa). **Digitalis**, is of undoubted benefit (B); the infusion best (R). **Transfusion**, when death from exhaustion is apparently imminent (B). **Facial Artery**, compression of (R). Keep head elevated and cool, warm the feet and hands by plunging into hot water, apply ice over the nose, resort at once to the tampon if bleeding becomes alarming. Cauterize with electric cautery any ulcers in anterior nares. [Compare HEMORRHAGE for formulæ.]

Eruptions Produced by Drugs, etc.

Aconite, vesicular exanthemata. **Antimony** (locally), papules, vesicles, pustules, similar to the eruption of small-pox. **Antipyrin**, erythema and urticaria, chiefly on thighs and abdomen, with much itching and dyspnea. **Antitoxin** (Diphtheritic), erythema, with pain in the joints. **Arsenic**, erythema, eczema, papules, vesicles, pustules. **Atropine**, erythema, like the rash of a scarlet fever. **Belladonna**, as Atropine. **Borax**, papules, scarlatiniform. **Bromides**, acne, chiefly on the face and back; pustules, deep tubercles with ecchymoses, ulcers, pemphigus. **Castor Oil**, urticaria. **Cinchona**, as Quinine. **Carbolic Acid**, erythema. **Chloral Hydrate**, erythema, on face and neck, itching, desquamation, eczema, petechiæ, purpura. **Codeine**, as Opium. **Copaiba**, also **Cubeb**, urticaria, erythema, eczema, pemphigus; the Copaiba rash has a preference for the ankles and wrists. **Cod-liver Oil**, acne. **Croton Oil** (locally), papules, pustules. **Digitalis**, erythema, after long usage. **Enemata**, of the simplest form, as soap and water, may cause a bright scarlet rash and other symptoms of a mild septic toxemia (Burford). **Iodides**, acne, papules, vesicles, pustules, eczema, ecthyma, ecchymoses and purpura; the Iodide rash prefers the face and back of neck and shoulders. **Mercury**, erythema, eczema. **Opium** and **Morphine**, erythema, papular eruption with marked desquamation and itching. **Phosphorus**, purpura. **Quinine**, erythema, scarlatina, papular erythema, hemorrhagic purpura, pemphigus and prurigo; the prevailing type of the Quinine eruption is erythema, or exceptionally eczema or purpura, and is essentially ephemeral; it is of a bright vivid hue, disappearing on pressure, and resembles the scarlatinal rash, first appearing on face and neck, and thence spreads over the body: in some instances it comes in distinct spots and resembles measles; in others it is an urticaria, with some edema, and distressing burning, tingling, and itching; five cases of purpura are authentically reported. **Rhus Toxicodendron** (and other varieties of Sumac), vesicles perhaps pustules, with redness, swelling and intolerable itching. **Salicylic Acid**, urticaria, purpura, pemphigus, vesicular angina. **Santonin**, pemphigus, vesicles. **Stramonium**, as Atropine. **Strychnine**, as Quinine. **Sulphur** (locally), erythema, eczema. **Tar**, acne. **Tartar Emetic** (locally), as Antimony; in some cases of poisoning by tartar emetic a rash of the above description appeared all over the body. **Turpentine**, as Copaiba.

Articles of Food producing eruptions are: Acid Fruits, may cause acute eczema. **Strawberries**, urticaria. **Apples**, acneform efflorescence about the mouth. **Walnuts**, inflammation of buccal mucous membrane. **Shell-fish**, urticaria. **Roast Turkey**, in one case caused great urticaria. **Lager Beer**, acne in some. **Alcohol**, aggravates cutaneous inflammations. **Butter**, **Oatmeal**, **Buckwheat**, **Fish**, are popularly credited with causing eruptions, but there is no evidence therefor. **Mangos**, pemphigus and other eruptions, in persons who are not accustomed to this fruit.

Erysipelas.

Antitoxin (Streptococcus), see page 182. **Pilocarpine**, to abort the disease, very efficient if used early, gr. 1/6 hypodermically, or fluid extract of Jaborandi internally; when free diaphoresis occurs, the temperature and pulse fall to normal and the disease is checked; not suitable to debilitated cases or those with a weak heart (Da C). **Aconite**, a favorite remedy with Liston, if used at beginning when fever high (Wa); no more useful agent in idiopathic erysipelas especially facial, and cases of sthenic type (B); at onset often cuts the attack short; is very useful in the erysipelas following vaccination (R); very valuable in sthenic cases (P); especially so in traumatic erysipelas (Tr). **Belladonna**, ♏v of tincture in water every hour for five or six doses, also locally; has astonishing power in superficial and non-vesicular forms, also when erysipelas attacks the brain and in the phlegmonous type (P); for similar indications as noted under Aconite, also when adynamia; if much fever combine it with Digitalis or Aconite, when much depression give it with Quinine; gr. ¼ of the extract with gr. ij of Quininæ Sulph. every 3 or 4 hours (B); the extract with Glycerin, equal parts, spread thickly over the surface (Quain); should be used both internally and externally and may be combined with Aconite (R). **Iron, Tincture of the Chloride,** the nearest to a specific yet discovered; the remedy of most service, any man being decidedly to blame who neglects its use; requires decided doses, gtt. xl every 4 hours (Da C); treatment by it very general but questionable (B); should be given with shorter intervals than 4 hours (R); is very successful in this disease (P); ten-drop doses every hour, or ♏xl every 4 hours (Quain); is also used locally with much success, being painted over the surface in full strength. **Quinine,** may be given with the Iron, also alone if thoracic complications, wherein Iron might be contra-indicated (Da C); if pulse soft and tremulous, or very rapid with low muttering delirium (D); a combination of Quinine and Tincture of the Chloride of Iron offers special advantages (Wa); in the more severe cases to sustain the vital powers and prevent cerebral embolism; but large doses, gr. xv–xx every 4 hours, are alone of any use (B). **Ammonium Carbonate,** when feeble circulation, cyanosis and delirium, also when any signs of embolism appear (B); highly useful in debilitated subjects (Wa); after free purgation the continued use of this salt is all that is needed in most cases (Watson). **Potassium Iodide,** with agents to secure free action of the bowels, skin and kidneys, the most efficient treatment in erysipelas ambulans, in which Iron and Quinine are useless (Da C). **Antipyrin,** is particularly efficient when hyperpyrexia (Ernst). **Rhus Tox.,** a very useful remedy in the vesicular form (P). **Tartar Emetic,** in doses of gr. $\frac{1}{16}$ frequently repeated, renders incontestable service (B). **Calomel and Jalap,** as purgative at onset, followed in 4 or 5 hours by Magnesium Sulphate ℥ss (Da C). **Chloral,** is an admirable adjunct to give sleep at night (Id). **Turpentine,** as a stimulant in traumatic erysipelas, more generally serviceable than alcohol (B).

Local Applications. **Silver Nitrate,** by Higginbotham's method in traumatic form; gr. lxxx of the brittle stick dissolved in ʒiv of water and painted 2 or 3 times over inflamed surface and beyond, after careful washing and drying (R); no agent more useful in subduing external inflammation. **Iodine,** painted over affected and neighboring surfaces, to prevent spreading (R). **Ichthyol,** is very efficient as a 10 to 25 per cent. collodion; Ichthyol and Ether, of each 5, Collodion 10 parts, with or without the addition of Castor Oil; has almost specific properties in this disease (Radcliffe). **Thiol,** dry, as a dusting powder, has given excellent results. **Iodized Collodion,** is very successful as a local application. [See formula on next page.] **Collodion,** a thick coat relieves (B). **Digitalis,** an infusion is of much service, applied as a lotion (R). **Sulphurous Acid** and Glycerin, equal parts, or a solution of Sodium Bisulphite (Dewar). **Zinc, Benzoated,** as ointment, or the Unguentum Zinci Oxidi, anything to exclude the air, and whichever one is most agreeable to the patient (Da C). **Bismuth,** the Ointment of the Oleate, a very certain application to allay itching and burning, lessen pain, etc. (Shoemaker). **Oil,** by inunction, is very grateful in simple erysipelas (B). **Oil of Turpentine,** painted over surface is said to be remarkably efficient. **Vaselin,** Lard or Mercurial Ointment diluted, ʒj to ℥j of Vaselin; the simplest applications are the best (B). **Carbolic Acid,** one part, with 8 to 14 parts of Oleic Acid, locally by inunction for 3 or 4 minutes every ¼ hour, all around the edge of the diseased part until it ceases to spread (Jacobi). **Cotton Wool,** sprinkled with flour or a mixture of Starch and Zinc Oxide, is a good application (B). **Earth,** clean yellow clay, free from grit or sand and powdered, applied directly to the skin in the form of a smooth paste, made by mixing it with water, the best of all applications, having properties of antiseptic, antiphlogistic, antipyretic, and antimorbific nature (Hewson).

Tracheotomy, promptly if edema of glottis occurs, the operation giving time for inflammation to subside (Da C). **Incisions**, may be necessary in traumatic erysipelas when limb is greatly swollen and inflamed; also in the phlegmonous variety (Id). **Diet**, a milk-diet is generally suitable; should be light but nutritious (R); feed the patient well (Da C). [Compare PHLEGMON.]

℞. Quininæ Sulphatis, . . . ʒj.
Ac. Sulphurici Dil., . . . q. s.
Aquæ, ... ℥ij.
Tincturæ Ferri Chlor., . . ℥ss.
Spt. Chloroformi, ... ℥vj.
Glycerini, . . q. s. *ad* ℥iv.
M. Sig.—A teasp. in water every two hours. (*Loomis.*)

℞. Tinct. Ferri Chloridi,
Syrupi Tolutani, . . . āā ℥j.
Liq. Potassii Citratis, . . ℥iv.
M. Sig.—Teasp. to tablesp. according to age, every 3 hours. ʒj has ♏x, ʒij has ♏xx, ℥ss has ♏xl. (*Anderson.*)

℞. Pyroxylini, ... ʒj.
Ætheris,
Alcoholis, ... āā ℥v.
Solve, et adde—
Ammonii Iod., ... gr. xl.
Cadmii Iod.,
Cadmii Brom., ... āā gr. xx.
M. Sig.—For local use with a camel's hair pencil. If the cadmium salts are not to be had use ʒj Ammon. Iod., and gr. xx of Pot. or Amm. Bromide. (*Humphreys.*)

℞. Plumbi Acetatis,
Ammonii Carb., . . . āā ʒj.
Aquæ Rosæ, ... ℥viij.
Ft. lotio. Sig.—Apply on lint, to allay irritation. (*Peart.*)

Erythema.

Antipyrin, internally for the itching, is efficient. **Belladonna**, useful in cases resisting ordinary treatment (B). **Quinine**, the most valued remedy in erythema nodosum (B). **Rhus Toxicodendron**, a valuable remedy (P[illegible]). **Zinc Sulphate**, as lotion, with Alum and Glycerin [see ECZEMA, for formula [illegible]]; or the **Acetate**, in ointment (see below). **Bismuth Subcarbonate**, dusted over erythema about genitals of infants soothes pain and promotes healing (B). **Mineral Acids**, Nitric and Nitro-hydrochloric, have been advantageously used in erythema from imperfect digestion (B). **Dusting Powders**, of Starch, Lycopodium or Buckwheat flour are very useful. **Thiol**, the dry form, as a dusting powder.

℞. Plumbi Carbonatis,
Bismuthi Subnit., . . . āā ʒj.
Sodii Bicarbonat., ... ʒss.
Ung. Zinci Oxidi Benz., . ℥ij.
Ft. unguentum. Sig.—Local use.

℞. Zinci Acetatis, ... gr. ij.
Aquæ Rosæ, ... ʒj.
Ung. Aquæ Rosæ, ... ʒj.
M. Sig.—Ointment.

Esophageal Affections.

Belladonna, the liniment with frictions to the sternum, often very useful as [illegible] as a palliative in stricture of the esophagus (Wa). **Conium**, in spasmodic contractions, with crampy pains of stomach, flatulence, and globus hystericus, [illegible] has proved very serviceable (Wa). **Hyoscyamus**, or **Conium**, in stricture of esophagus, if much irritability; with occasional leeching to relieve exacerbations of pain or spasm (D). **Silver Nitrate**, in stricture of the esophagus, a weak solution on sponge probang (D). **Anesthetics**, should be used only to meet temporary indications (W). **Nutrient Enemata**, in stricture of the esophagus, when swallowing impossible (R); may, in some cases, even preserve life (Wa). [See ENEMATA.] **Dilatation**, by bougies, in non-spasmodic (structural) stricture, the only appropriate treatment (H). [Compare CHOKING, DYSPHAGIA.]

Exhaustion.

anilid, for the "tired feeling," a pinch put into the mouth, mixed with
and swallowed, rests one up in a few minutes and makes one as fresh as
(Brodnax). **Arnica**, a few drops internally for aching of the muscles
ı nerve prostration with general aching from over-fatigue (P). **Phos-**
, for physical or mental exhaustion; also in depression from overwork
Calcium Phosphate, combined with **Calcium Carbonate** and **Ferric Phos-**
gr. j of each for a dose (R). **Potassium Bromide**, when insomnia, bad
s and irritability (R). **Opium**, gtt. j of Laudanum with 2 or 3 of the
ra Nucis Vomicæ, 3 or 4 times a day, for symptoms of exhaustion with
:hes, flushing and dyspepsia (R). **Ammonia**, internally; its influence is
ef (R). **Coffee** or **Tea**, in hot or cold climates (R). **Castor**, is service-
ut seldom used (P). **Musk**, benefits all forms of nerve-exhaustion (P).
fuga, for headache from overstudy or excessive fatigue (R). **Alcohol**,
ıe in all conditions of fatigue (P). **Coca**, lessens the sense of fatigue
exertion, relieves thirst, and obviates the effects of a too rarefied atmo-
; is suitable for weakly subjects easily fatigued and convalescents (P).
ıe, has been used successfully in exhaustion from sunstroke, loss of blood
arrhea (P). **Wet Sheet**, dripping, cold, as a restorative and to prevent
of muscles (R). **Sea Bathing**, is also valuable (R). **Habits**, change of
ıtion better than absolute rest. [Compare ADYNAMIA, CONVALESCENCE,
NIA, MYALGIA, NEURASTHENIA.]

Exophthalmos.

lgin, has been used with some success in the treatment of exophthalmic
(Churton). **Belladonna**, ♏v of tincture hourly, of great service (R);
recorded from its use are very remarkable, but Digitalis will usually
r better (P). **Duboisine**, gr. $\frac{1}{120}$ of the sulphate 2 or 3 times daily, has
:ed remarkable results in one case (Hunt). **Opium**, may be of use in
:ases (P). **Iron**, with Digitalis, seems to do more good than any other
ne (Da C). **Chalybeate Waters**, are beneficial (B). **Aurum Bromide**,
ly doses of gr. $\frac{1}{8}$ to $\frac{1}{6}$, continued until its characteristic headache is
:ed (Goubert). **Bromides**, with Iron, of very great value in the milder
associated with anemia in young women (Y). **Digitalis**, to raise arterial
ı and slow the heart, is decidedly ameliorative in young subjects (B);
e cases beneficial, but in others it increases the cardiac excitement and
matters worse, while its tendency to cause gastric irritation is more
:st in this disease than in any other (Y). **Strophanthus**, quiets the cardiac
and is of real service in this malady; 5 minims may be given thrice
Y). **Convallaria**, ameliorates the painful palpitation (Wa). **Arsenic**,
twice daily, increased with intermissions up to gr. $\frac{1}{18}$ daily, is my favorite
y (Jaccoud). **Zinc Valerianate**, gr. j thrice daily, is valuable to allay the
ıs symptoms and the insomnia (Y). **Thyroid Extract**, has proved bene-
see page 159]. **Splenic Extract'** has given excellent results (W); [see
66]. **Pancreatin**, in full doses successfully used (Liegeois). **Galvanism**,
cervical sympathetic and pneumogastric, also of the eyes and thyroid
is decidedly curative in uncomplicated cases (B).

Exostosis.

ssium Iodide, may promote absorption when recent; also use friction
ı ointment of **Mercury** or **Iodine** (D). **Aconite**, was used by Störck (P).
ry, a moderate course of mercurials may be effectual, when exostoses are
a blow or from syphilis (D). **Excision**, if required (MacCormac). Ex-
of the clavicles in children almost always disappear of themselves (D).

Eye Diseases.

Belladonna, locally and internally in iritis, conjunctivitis and other inflammations. **Atropine**, in iritis, locally; hypodermically in glaucoma (R); the best application generally in inflammatory conditions of the eye; the indiscriminate instillation of Atropine in persons over 35 or 40 years of age by general practitioners is to be condemned, being liable to light up an incipient or latent glaucoma. **Pilocarpus**, is used with great benefit in many eye-affections, particularly amblyopia from alcohol and tobacco, detachment of the retina, chronic iritis, keratitis, hemorrhage into the vitreous, glaucoma, muscæ, atrophic choroiditis, hemorrhages of the retina, white atrophy of the optic nerve, and inflammatory affections with effusion and exudation, to promote resolution and absorption (Wecker). **Strychnine**, hypodermically in muscular asthenopia, amblyopia, amaurosis, and in progressive nerve-atrophy not dependent on intercranial disease (R); increases the sensibility of the eye, the field of vision becoming extended, and the vision more acute (Br). **Ergot**, is useful in many eye affections, especially disturbances of accommodation, acute and chronic inflammations, and the blepharitis and pustular conjunctivitis of children (Wa): is a myotic. **Acetanilid**, is exceedingly effective in optic neuritis with pain, not only to remove the latter but also to arrest the inflammatory process (Dujardin-Beaumetz). **Cocaine**, as a local anesthetic in ophthalmic surgery, a 4 per cent. solution, by instillation, sometimes injection required, as into the muscles for squint operation; is mydriatic, and in some cases panophthalmitis has resulted after operations under it (R). **Chloroform**, vapor, close to a photophobic eye, relieves (R). **Oleate of Mercury and Morphine**, outside the eye in palpebral conjunctivitis and stye; also in syphilitic iritis (R). **Silver Nitrate, Copper and Zinc Salts**, are much used in weak solutions for conjunctivitis, etc. **Euphrasia**, had an extended reputation in Germany, is a mild astringent, and of service in catarrhal conjunctivitis (P). **Pulsatilla**, as lotion in inflammations and ophthalmic cases (P). **Santonin**, gives good results in inflammatory and atrophic conditions of the retina and optic nerve, and in the stage of effusion of many other inflammations (Wa). **Ruta**, minim doses, night and morning, in dimness of vision depending on functional amaurotic condition, produces good results (P). **Physostigmine**, topically, to contract pupils; to reduce excessive atropinization; stimulates the third nerve (P). [Compare AMAUROSIS and AMBLYOPIA, ASTHENOPIA, CATARACT, CONJUNCTIVITIS, CORNEAL OPACITIES, GLAUCOMA, IRITIS, KERATITIS, MYOPIA, OPHTHALMIA, PHOTOPHOBIA, RETINA, STRABISMUS, etc., also the lists of Mydriatics, Myotics and other Agents acting in the Eye, on pages 57 and 58.]

Eyelids.

Calomel, locally, or Brown Citrine Ointment, as an application in many eases of the lids (B). **Mercury and Morphine**, the 20 per cent. ointment Lard, applied outside the lid, for stye (R). **Pulsatilla**, internally, and ex nally as wash, in ophthalmic cases and inflammations; the so-called stye n often be aborted by this treatment (P). **Cadmium**, much esteemed as co rium, gr. ij of sulphate to ℥j aquæ rosæ (R). **Zinc and Copper Sulphates**, esteemed applications (B). [See CONJUNCTIVITIS for formulæ.] **Ergot**, aqueous infusion as a collyrium, in ptosis and paralysis of the eyelids (W **Tannin**, a strong solution (1 to 3 aquæ) locally; or a weaker solution (1 to 30 or 50 aquæ), is much employed; also used in pomade, or as fine pow (Wa). **Veratrine**, in solution, brushed over lids once daily in painful spasmo contraction of the orbicularis (Wa). **Ammonium Chloride**, in solution as lotio for ecchymosis of eyelids, vulgarly known as black eye. **Capsicum**, the tinctu or infusion for a black eye (see under ECCHYMOSIS). [Compare BLEPHARIT CONJUNCTIVITIS, ECCHYMOSIS, ECTROPION, PTOSIS, etc.]

Face.

Amyl Nitrite, ♏$\frac{1}{10}$ to ⅙, in 30 times its volume of spirits, for flushing of face, or sensation of flushing, with cold feet and hands and great prostration, occurring in women at change of life (R). **Curare**, effective in facial spasm, when other remedies failed (P). **Blisters**, behind the ear, in facial palsy, followed by warm covering to the part (H). **Strychnine**, has improved some cases of facial palsy (P). [Compare ACNE, FRECKLES, NEURALGIA, ODONTALGIA, PAROTITIS, TIC-DOULOUREUX.]

False Pains.

Tartar Emetic, with small doses of Opium and external fomentations, where evidence of congestion (L). **Opiates**, to allay uterine irritation, after rectifying any derangement of bowels (L). **Opium**, is valuable, having specific action on uterine muscular fibres, relaxing some, stimulating others (Wa). **Acetanilid** may be given with benefit.

Feet.

Arsenic, swelled feet of old or weak persons (R); edema of feet and ankles in the old, from feebleness of the heart (B). **Lead**, as ointment, equal parts of Emplastrum Plumbi and Linseed Oil spread on linen and wrapped round sweating feet, to be renewed every third day for nine days (R). **Potassium Permanganate**, solution gr. j to the ℥ as a wash, will remove fetor of feet (B); temporarily discolors the skin. **Boracic Acid**, in strong solution, is used with good results. **Chloral**, 1 in 50 of water as bath, efficient against fetor. **Sodium Bicarbonate**, a solution freely applied will remove fetor (B). **Belladonna**, will check fetid secretions (R). **Salicylic Acid**, in solution with Borax, the most agreeable and efficient deodorant for fetid perspirations (B); ʒjss–iij with ℥iij of dried Alum in powder, applied freely to feet after washing and drying; Acid Salicylic 3, Magnesium Silicate 87, is the composition of the powder used in the German army for sweating of the feet. **Iron**, the Chloride, mixed with ⅓ its weight of glycerin, as paint to the soles and interdigital spaces, in severe cases of sweating feet; should be exposed to the air while drying; repeat after 48 hours at first, subsequently at longer intervals, during which the feet should be washed in vinegar and water night and morning and powdered with salicylated talc or starch and tannin (Vignol). **Alum**, powdered, locally, the most satisfactory application for bromidrosis (Baylor). **Sodium Chloride**, 3 tablespoonfuls to ½ a pint of water, as antiseptic lotion for tender feet, answers perfectly in most cases. **Ice**, to the spine, or heat and cold alternately, to equalize the circulation, has been strongly advocated (Wa). **Stockings**, should be changed every day, and dipped in a strong solution of Boric Acid and dried, to effectually check fetid perspirations. **Cold Footbath**, and drying with friction, for cold feet (R). [Compare CHILBLAINS.]

℞. Ac. Salicylici, ... gr. xv.
Amyli, ... gr. cl.
Talci, ... ℥iij.
M. et trit. Sig.—Locally. (*Kohnhorn.*)

℞. Ac. Borici (pulv.), . . ʒjss.
Vaselini, ... ℥j.
M. Sig.—Ointment for bromidrosis.
(*Championnière.*)

Fever.

[*See also the titles of the Fevers, in their alphabetical order.*]

Guaiacol, applied to the surface, as antipyretic (see page 294). **Aconite**, has the highest value in the eruptive fevers, also in all hyperpyrexiæ (B); always indicated in early stage of simple inflammatory fevers, pneumonia, and in most acute congestions (P); has marvellous power over sthenic fevers; the thermometer should go hand in hand with Aconite (R). **Veratrum Viride**, has considerable power as an antipyretic; useful in rheumatism and pneumonia (P); in delirium ferox of fevers it is of value (B); strongly recommended in both sthenic and asthenic fevers (R). **Belladonna**, in the eruptive fevers, especially scarlatina (B); in typhus, with delirium, insomnia, painful sensitiveness to light and sound, and in all hyperemic states of brain and spinal cord (P); is prophylactic often against scarlet fever (Pf); in delirium of fevers, also excellent in typhus (R). **Gelsemium**, in remittent and typho-malarial, of real benefit; is antipyretic (B); in bilious remittent, of value (Pf). **Arsenic**, in prostrating acute fevers to strengthen pulse and invigorate patient; except quinine no drug subdues intermittents so well (R); in malarial, especially typho-malarial, it is of great value (B). **Quinine**, in the eruptive fevers and all malarial, remittent and intermittent; as apyretic less effective and more dangerous than cold baths; useless in typhus and typhoid, except for hyperpyrexia (B); it is antimiasmatic, antiseptic, and antiphlogistic, and of great value in intermittent, septicemic, and hectic fevers (P): large doses at night to reduce temperature in typhoid and other fevers, are strongly urged in Germany. **Cinchonine** is better than quinine as prophylactic against ague (R). **Antipyrin**, the type, also the best, of the new series of synthetical antipyretics, which includes Acetanilid, Kairin, Phenacetin, Chinolin, Thallin, etc.; is antipyretic and diaphoretic, moderates the intensity of the febrile movement, and is especially indicated in self-limited diseases with persistent hyperpyrexia, especially pneumonia, typhoid, etc. **Phenacetin**, the favorite antipyretic among the new synthetical compounds; is efficient and safe. **Kairin**, is an efficient antipyretic, but profusely diaphoretic, also a cardiac and nerve depressant of great power, and highly dangerous in pneumonia and other fevers where the heart is weak; it often produces nausea and vomiting with headache and tinnitus aurium (P). **Resorcin**, has been given in acute rheumatism, typhoid, typhus, pneumonia, erysipelas, etc., as an antipyretic; like Kairin, however, its action in lowering temperature is transient as compared with Quinine or Salicylic Acid (P); may be used hypodermically as it is not irritant (B). **Salicylic Acid**, or **Sodium Salicylate**, nearly equal to Quinine as an antipyretic; very useful in all forms with high temperature and in intermittents, especially in septicemia, pyemia, erysipelas and surgical fevers (R). **Digitalis**, the German antipyretic; very useful in scarlet fever, rheumatic and pneumonia (B); especially in typhoid (R). **Cimicifuga**, as substitute for Digitalis, but less effective; good in hectic fever (B). **Hydrastine**, intermittents, typhoid with copious sweats (P). **Arnica**, is antipyretic, full doses in sthenic cases, small (♏v of tincture) in asthenic; large and small doses produce different results (B); in rheumatic fever and typhoid it is highly extolled (P). **Camphor**, subdues reflex excitability; is praised as stimulant in adynamic fevers (P); in adynamic fevers and where there is delirium (R). **Mercury**, large doses of Calomel, the German specific treatment of typhoid (B); small doses in typhoid at commencement; has marked effect on tonsils in scarlatina (R). **Rhus Tox.**, in rheumatic fever after Aconite, and in scarlatina with typhoid symptoms, is invaluable (P). **Opium**, much less used than formerly; useful in delirium and with Quinine in remittents and intermittents (B); fevers characterized by prostration, insomnia and delirium, noisy or muttering, with picking of bed-clothes and twitching of the muscles,—in such cases Opium, judiciously given, may save an almost hopeless case (R): Morphine, hypodermically, the best form in febrile diseases, being less disturbing to the stomach and digestive power (B). **Turpentine**, in typhoid, puerperal, and yellow (♏x–xxx) as a stimulant to vaso-motor nervous system (B); as enema (ʒss–j in starch mucilage with ♏x of Tinct. Opii if pain) invaluable when in typhoid hemorrhage occurs with tympanites (R). **Tartar Emetic**, minute doses (gr. $\frac{1}{16}$) frequently repeated and with Opium are of great value in many acute febrile diseases (B); as a diaphoretic; in ague; in large doses to abort specific fevers (B). **Muriatic Acid**, very useful in all forms, especially in typhoid and the exanthemata; relieving dryness of the mouth and fauces, increases digestion and restrains the diarrhea (B).

Drinks, such as raspberry vinegar, citric acid, etc., very grateful and useful (R, B); two sliced limes or lemons, with ℥ij of sugar in Oj of boiling water, cooled and strained, makes an agreeable refrigerant beverage (Wa). **Baptisia**, useful in common continued fever, or in the first stage of typhoid; drop-doses of a fresh tincture every hour. **Eucalyptus**, has given varied results in malarial fevers, some observers praising it very highly (P). **Valerian**, has done much good in fevers of a nervous character (P). **Sumbul**, is used in Russia for low fevers of typhoid type (P). **Cocculus**, for tympanites of typhoid (P). **Ammonium Acetate**, as a diaphoretic and in simple forms, as catarrhal; the **Carbonate** in scarlet fever and measles (R). **Purgation**, by Castor Oil, Magnesium Sulphate, etc., before exhaustion (R). **Mustard Bath**, on recession of rash in eruptive fevers (R). **Aliment**, milk and beef-tea alternately, every 3 hours; milk in fevers and in inflammations of the digestive tract (B). **Alcohol**, in low conditions is useful when it causes improvement in symptoms, which may become worse (R); Coffee better than alcohol (P). **Water**, especially carbonated water as a drink, is a valuable adjunct to remedies in the treatment of fevers; warm baths, the wet pack, hot and cold compresses, fomentations, moist inhalations, etc., have great value (see the various fever titles): a most important agent: cold baths or cold wet pack to reduce temperature (B); cold affusion, baths, packing, ice and ice-bag, hot affusion and sponging, all of great value in every form (R). [Compare FEVERS, TROPICAL.]

℞. Tinct. Aconiti, ... ʒss–j.
Spt. Ætheris Nitrosi, . ℥ij.
Glycerini, . . q. s. *ad* ℥ij.
Sig.—A teasp. hourly to an adult.

℞. Phenacetini, ... ʒss–j.
Aquæ Cinnamomi, . . ℥iv.
M. Sig.—A teasp. every 2 hours for children, to control pyrexia.

Fever, Simple.

Aconite, in small repeated doses, the best remedy for febricula (B); in ordinary febrile conditions, if given early, will abate fever and induce free perspiration; may be administered in conjunction with any other remedy indicated (R). **Veratrum Viride**, in small doses, as antipyretic (P). **Hyoscyamus** or **Belladonna**, very useful in febricula, especially for head symptoms and constipation (P). **Gelsemium**, when remittent or bilious symptoms (P). **Arsenic**, if typho-malarial symptoms (B). **Phenacetin**, in hourly doses of gr. ij or less, in the simple continued fever of children, as antipyretic. **Hydrochloric Acid**, in the continued fever of childhood, has a beneficial influence (West). **Valerian**, when nervous excitability (P). **Lemon-juice**, as lemonade or with Potassium Bicarbonate, as a mild diaphoretic and diuretic (P). **Pomegranate-juice** is very grateful if mixed with sugar or honey (P). **Bromides**, gr. ss–j every quarter-hour are excellent for the febrile disturbances of children (Smith). **Baths**, warm, in simple fevers of children (R). **Aliment**, milk and beef-tea alternately every 3 hours, the most useful (B).

℞. Ac. Hydrochlor. Dil., . ʒss.
Spt. Ætheris Co., . . . ℥jss.
Syr. Rosæ, ... ℥ss.
Aquæ Camph., q. s. *ad* ℥iv.
M. Sig.—Teasp. to tablesp., according to age, every 6 hours.
(*Modified from West.*)

℞. Potassii Acetatis, . . . ʒij.
Spt. Ætheris Nitrosi, . ℥iv.
Syr. Simplicis, ... ℥j.
Liq. Ammonii Acetatis, ℥ij.
Aquæ Camphoræ, q. s. *ad* ℥viij.
M. Sig.—Teasp. to tablesp. doses, according to age.

Fevers, Tropical.

Unclassed fevers of the tropics include a simple continued fever, a low fever and a non-malarial remittent (Crombie); also a double continued fever (Mn). **Calomel** and **Quinine Bisulphate**, āā gr. iv, with Rhubarb and Jalap, āā gr. vj, as in *Dr. Livingstone's "liver rousers,"* has given excellent satisfaction at the commencement of such cases, especially when symptoms of hepatic congestion exist (Potter); purgation should not be actively continued, but each case should be treated on its own merits and on general principles (Mn). **Quinine** must not be continued if it has been tried without benefit (Id). **Antipyrin**, or some similar drug, for the headache, if no contra-indication exists (Id). **Medication** should be confined to some simple fever mixture, there being no specific treatment for any of these affections (Id). **Diet**, bland, unstimulating and fluid. **Sea-voyage**, is especially serviceable in low fever, which is unrelieved by quinine or arsenic (Mn).

Fistula.

Piper Nigrum, the confection, as a gentle stimulant in anal fistula (P). **Iodine**, by injection, sometimes curative, but generally fails (Wa). **Sanguinaria**, as injection, has cured (P). **Capsicum**, the weak infusion, a useful stimulant in fistulous ulcerations (P). **Glycozone**, ʒj in ℥j of lukewarm water, as enema once or twice daily, soon produces good effects in cases of fistula in ano (Edson). **Bismuth Subiodide**, after operation, dusted over the surface of the wound after washing, to stimulate granulations when the healing process is indolent, is remarkably efficient. **Surgical**, division of sphincter in anal fistula by knife or ligature, the best treatment (D); in fistula lachrymalis dilatation of passage by probing the canaliculus or slitting the canaliculus up (D); in vesico-vaginal or recto-vaginal, surgical methods best. **Diet**, should be nourishing and digestible; fresh air and good general hygienic conditions are necessary (R).

Flatulence.

Nux Vomica, will remove flatulence and intestinal indigestion (B); when constipation, heartburn, weight on head (R). **Charcoal**, gr. v or x, soon after or just before meals (R); mixed with Bismuth (R). **Chloroform**, pure, in drop doses, benefits (R); by far the best agent in flatulent dyspepsia to prevent flatulence, always given well diluted (Huchard). **Carbolic Acid**, when no acidity present (R). **Turpentine**, gtt. iij–v on sugar, will quickly relieve (B). **Strontium Bromide**, is excellent in flatulence from decomposition. **Asafœtida or Valerian**, quickly relieves the flatulence of hypochondriasis (P). Asaf. ʒj of tinct. to O½ water, dose ʒj; useful for children (R). **Sodium Sulpho-carbolate**, gr. xxx after eating, will be found very serviceable (R). **Phosphoric Acid**, dilute, is often promptly alleviative. **Anise**, the Oil, also Ether, or any other member of the carminative group (see page 41), will promote the expulsion of gas from the stomach and intestines. **Mercury**, in flatulence with clayey stools (R). **Calumba**, an effective remedy for flatulent disposition is an infusion of ℥ss of Calumba and Ginger, ʒj of Senna, hot water Oj, a wineglassful ter die (P). **Potassium Permanganate**, in flatulence attendant on obesity (B). **Physostigma**, flatulence of women at climacteric (B). **Sulphurous Acid**, in 5 to 10 minim doses, when flatulence due to fermentation (R). **Diet**, abstain from sugar, starchy food and tea—especially sugar; eat little, slowly and regularly; as a general rule abstain from alcoholic drinks and from vegetables, especially cabbage. **Pepsin** or **Ingluvin** after meals, to promote digestion (R). [Compare COLIC, DYSPEPSIA.]

℞. Tinct. Illicii Anisati,
Tinct. Gentianæ,
Tinct. Nucis Vomicæ, āā ʒj.
Chloroformi, ... ♏xv–xxx.
M. Sig.—8 to 10 drops in a winegl. of water, before meals.

℞. Bismuthi Salicylatis,
Magnes. Calcinat., . āā ʒiv.
Pulv. Carb. Ligni, . . ʒvj.
Olei Anisi, ... ʒij.
Ft. pulv. Sig.—A teaspoonful before each meal. (*Huchard.*)

Flushing-heats.

Nux Vomica, ♏ij of the tinct. with ♏j of Laudanum in hysterical flushings of the middle-aged, with flatulence, weight on head and perspirations (R). **Amyl Nitrite,** ♏$\frac{1}{10}$ to ⅙ in thirty times its volume of rectified spirits, is effective for flushing of face, or sensation of flushing, followed by coldness, with cold feet and hands and great prostration occurring at climacteric chiefly (R). **Potassium Bromide,** at climacteric, with mental depression (R). ***Zinc* Valerianate,** or **Valerian,** flushings at the climacteric (R). **Eucalyptol,** for the flushings, palpitations and flatulence incident to the change of life (R). [Compare CLIMACTERIC DISORDERS.]

Foreign Bodies.

In the Eye, remove by bathing, or wiping towards the lower inner corner with a soft, moistened handkerchief or a bent bristle, the two ends being held in the fingers; use tepid solution of Vinegar (ʒss to the ℥) for removing lime, tepid water for powder; then apply a weak Zinc or Alum collyrium, or instil a solution of Atropine (gr. ij to the ℥), or of Cocaine 4 per cent. **In the Ear,** examine carefully with speculum before removal; first syringe with warm water, or instil a drop of sweet oil to drive out insects, before using the forceps; apply equal parts of Laudanum and Olive Oil, a few drops on cotton, if much pain. **In the Nose,** a current of tepid salt water, forced up one nostril, may force down the body through the other, if the mouth be held open. **In the Larynx** or **Pharynx,** if water can be swallowed the obstruction is in the trachea. Never push a body down; remove by curved forceps or blunt hook. If passed into the stomach use solid diet to inbed the article. If all fail and the case be urgent, resort to catheterism or tracheotomy. **In the Flesh, remove at once by forceps, or sponge and water.** [Compare ASPHYXIA.]

Fractures and Dislocations.

Arnica, internally is excellent to neutralize the ill effects of mechanical injuries, ♏v–x in a wineglassful of water every 2 or 4 hours; when used after amputations it certainly has the power of promoting the rapid union of the surfaces; the infusion is better than an alcoholic preparation for external use (P). **Aconite,** quickly and repeatedly, if feverish symptoms ensue (P). **Iodine,** internally and by friction, occasionally useful in ununited fractures (Wa). **Calcium Phosphate,** promotes formation of callus (Wa). **Opium,** useless in surgical fever and may do harm (Cl); for nervousness or muscular spasms after dressing, gr. ¼ of Morphine hypodermically as anodyne (Ag). **Benzoin,** the tincture on lint as a dressing for compound fractures and other severe injuries, leads to rapid and satisfactory healing (Bryant). **Carbolic Acid,** 1 to 20 or 1 to 40 solutions, for irrigation and dressings in compound fractures, obviates pyemia and most of the other preventable causes of death (P). **Lead-water and Laudanum,** on lint, or a **Calendula** lotion to the part, after reduction of the injury, with morphine hypodermically and perfect quiescence. **Diet,** should be very simple for a week or ten days. [Compare WOUNDS.]

Freckles.

Resorcin, as paste with Zinc Oxide, applied to the face, to promote peeling of the skin and removal of freckles and other superficial spots (Unna). [See under ACNE]. **Iodine,** the tincture or glycerite, locally (B). **Liquor Potassæ,** ʒj in ℥ij aquæ rosæ, as a lotion (Todd). **Benzoin,** the compound tincture with water, as cosmetic to remove freckles (P). **Sodium Borate,** a saturated solution of Borax is a safe and often efficient lotion to remove freckles (B). **Lime-water**, and Olive Oil, equal parts, with a little Liq. Ammoniæ, as liniment (Wa). **Potassium Carbonate**, makes a good lotion for freckles, sunburn and tan (B). **Mercury**, the Bichloride, with Alcohol and Glycerin, as a lotion, has been found effective: Donovan's solution, ♏lxxx to ℥viij of water, of which ℥j every three hours, has been highly successful (Wa).

℞. Potassii Carbonatis, . . . ʒ iij.
Sodii Chloridi, ... ℥ ij.
Aquæ Aurantii Flor., . . ℥ ij.
Aquæ Rosæ, ... ℥ viij.
M. Sig.—Face-wash. (B.)

℞. Hydrarg. Chlor. Corr., . gr. vj.
Ac. Hydrochlor. Dil., . . ʒ j.
Alcoholis, Aq. Rosæ, . āā ℥ ij.
Glycerini, ℥ j, Aquæ, *ad* ℥ viij.
Apply at night, wash off in morning.

Gangrene.

Salicylic Acid, pure, in powder locally, to destroy fetor and change the character of the morbid action (B). **Carbolic Acid**, acts in the same way (B); a 1 per cent. solution as lotion in gangrenous ulcers (Wa). **Sodium Sulphate**, in solution, 1 to 5 or 10 of water, as lotion or applied on compresses, to destroy odor, soothe pain and restore healthy action (Wa). **Ammonium Chloride**, in solution as baths and fomentations, very successful in one case of senile gangrene (Wa). **Cinchona**, or better, Quinine, has often proved of value (P); generally decoction of Cinchona is best (Wa). **Turpentine**, locally, after removal of gangrenous part, a most efficient application (B); by stomach and inhalation from hot water in gangrene of lungs; the oil locally in dry and chronic gangrene (P). **Sanguinaria**, has been recommended (P). **Oxygen**, as gaseous bath in senile gangrene (R). **Charcoal**, as poultice, value doubtful (R). **Citric Acid**, Lemon-juice dropped into wound, which is then covered with lint steeped in a solution of Chlorine; very effective for hospital gangrene in Parisian hospitals (*Lancet*). **Ferric Chloride**, locally, is considered superior to the mineral acids (Wa). **Nitric Acid**, strong, applied carefully, until the ulcer is converted into a firm, dry mass (Wa); is probably the best escharotic, next to Bromine, for destruction of gangrenous tissue (B). **Bromine**, is the best escharotic for hospital gangrene (B). **Chromic Acid**, is a very efficient caustic, penetrating deeply with but little pain (B). **Opium**, to soothe the pain, and diminish restlessness and irritability (Wa). **Myrtol**, 1 or 2 drops, in capsules, internally, for gangrene of the lungs.

Gastralgia, Gastrodynia.

Resorcin, internally, acts exceedingly well. **Opium**, in some form necessary to relieve the pain in severe cases (Da C). **Morphine**, is of great value (P); subcutaneously in epigastrium very efficient, or in small doses with Bismuth and milk before meals (R). **Belladonna**, is useful in painful affections of the stomach (R). **Atropine**, often relieves promptly, and is excellent in neuralgic pain of the abdominal viscera (P). **Nux Vomica**, an excellent stomachic, gtt. v–x of tincture before meals (B); gtt. j–ij every 2 hours in many forms of gastric derangement (R). **Strychnine**, hypodermically for gastralgia and gastrodynia (R); in very small doses, gr. $\frac{1}{100}$–$\frac{1}{32}$ two or three times daily, a very successful remedy (P). **Arsenic**, sometimes dissipates the pain surprisingly (B); a drop of Liquor Arsenicalis before food in irritative dyspepsia and gastralgia with heartburn (R). **Bismuth Subnitrate**, when gastralgia due to irritation of mucous membrane, acts well alone, but is most efficient when given with aromatic powder and a little Morphine (R); or a combination of Bismuth and Arsenic in more chronic cases (B); the Subcarbonate is especially adapted to gastralgia, with laborious digestion and putrid or acid eructations (Wa). **Manganese**, Black Oxide in gastrodynia and pyrosis (R). **Zinc Oxide**, an excellent rem-when gastralgia occurs after food, gr. v–x with aromatic powder and Morphine before meals (B). **Silver Nitrate**, in solution to check the pain of many stomachal disorders (R); a pill of gr. ss, with Extr. Hyoscyami gr. ij–iv (Wa). **Hydrocyanic Acid**, often cures rapidly when gastralgia from nervous derangement (B); may check vomiting as well as relieve pain (R); Cherry-laurel water a useful form (P). **Nitro-hydrochloric Acid**, gtt. ij–iij of the dilute acid, is serviceable (Da C). **Ether**, a few drops or the compound spirit ♏x–xx, often relieves quickly (B). **Chloroform**, ♏ij–v on sugar, often relieves (B). **Chloral**, sometimes relieves pain in gastralgia (R). **Pulsatilla**, is efficient in many cases of painful dyspepsia, with coated tongue, headache and nervous depression (P). **Pepsin**, when gastrodynia from indigestion (P). **Creosote**, checks pain after food (R). **Cocaine**, in doses of ♏v of a 4 per cent. solution every hour, given by the mouth for its local action, is an efficient gastric sedative and anodyne. **Alum**, often affords relief (B). **Ergot**, of value in visceral neuralgiæ (P). **Alkalies**, for pain in stomach, Liquor Potassæ generally employed (R). **Quinine**, in cases showing periodicity and those of neuralgic type (P). **Sodium Salicylate**, for gastralgia with fermentation (R). **Nitroglycerin** allays the pain speedily (B). **Carbonic Acid Water**, in painful and irritable conditions; may be mixed with milk (R). **Milk-cure**, very efficacious in obstinate cases (B). **Galvanism** of the pneumogastric, and locally to the organ itself (B). **Aquapuncture** has given extraordinary relief (B). **Diet** is of the greatest importance; food should be digestible, varied and plainly cooked; persons of sedentary life should refrain from much animal food; meals regular and frequent, eating little at a time and that very slowly. Alcoholic beverages do harm as a rule, but may benefit particular cases. Eating should be done in as agreeable a frame of mind as possible and the patient should rest for a time after a meal. [Compare ACIDITY, DYSPEPSIA, NEURALGIA.]

℞. Morphinæ Sulph., ... gr. j.
Ac. Carbolici, ... ʒss.
Aq. Menth. Pip., . q. s. *ad* ℥iv.
M. Sig.—Teasp. thrice daily.
(*Da Costa.*)

℞. Bismuthi Subnit., ... ʒij.
Ac. Hydrocy. Dil., . . . ʒss.
Mucil. Acaciæ,
Aq. Menth. Pip., . . . aa ℥ij.
M. Sig.—Tablesp. thrice daily.

℞. Atropinæ Sulph., ... gr. j.
Zinci Sulph., ... ʒss.
Aquæ Destil., ... ℥j.
M. Sig.—3 to 5 drops two or three times daily. (B.)

℞. Bismuthi Subnit.,
Magnesii Carb., . . . aa gr. xvj.
Ac. Hydrocy. Dil., . . . ♏x.
Aquæ, ... ℥iv.
M. Sig.—Dessertsp. for a child of 3 years in flatulent gastrodynia and gastralgia.

℞. Ac. Hydrocy. Dil., . . . ʒij.
Aq. Laurocerasi, . q. s. *ad* ℥iv.
M. Sig.—Teasp. every 4 hours.

℞. Pepsini, ... ʒj.
Ac. Hydrochlor. Dil., . . ʒss.
Glycerini, ... ℥jss.
Aq. Cinnamomi, ... ℥ijss.
M. et filtra. Sig.—Tablespoonful doses for slow and feeble digestion.

Gastric Dilatation.

Carbolic Acid, internally to allay fermentation, with an occasional washing by the stomach-pump (Da C). **Strychnine**, hypodermically or by the mouth, or **Nux Vomica**, the best remedy, conjointly with washing of the stomach and strict diet (Da C). **Bismuth Subnitrate**, with Magnesia or Soda, or Lime-water frequently, for the acidity, which is one of the most distressing symptoms (Fenwick). **Bismuth Salicylate**, as an internal antiseptic, is highly praised. **Salophen**, relieves the fermentative disturbances. **Diet**, should be free from all starch and sugar and from vegetables of any kind (Fenwick); milk not advisable as much fluid will further dilate the organ; solids better, as small quantities of dry, stale bread or gluten bread and underdone meat (Da C).

Gastric Ulcer.

Arsenic, Fowler's solution in drop doses lessens the pain and relieves the vomiting remarkably (B); has given relief when commonly-used remedies failed (B); gives good results when used in very small doses (Da C). **Bismuth Subnitrate,** relieves pain and vomiting and contributes to the cure (B); see under GASTRALGIA for formulæ. **Chloroform** 1, with Bismuth Subnitrate 3 and Water 150, of which ʒj–ij hourly, or without the bismuth, which is not necessary, gives marked improvement in recent ulcer as well as in long-standing cases (Stepp). **Silver Nitrate,** in solution, to check pain and relieve the vomiting (R); is next in value to Bismuth, promoting cicatrization and easing the pain (B). **Silver Oxide** is equally efficient, and is not liable to produce staining (Da C). **Atropine,** often happily relieves the pain and vomiting even when given in very small quantity (B). **Morphine,** for the pain and vomiting (R); in full doses if perforation occurs, to localize peritonitis until adhesions take place (Da C). **Ergotin,** 1 part to 10 of water, of which gtt. xv hypodermically several times a day for the hemorrhage. **Gallic Acid,** in 5-grain pill every hour for hemorrhage. **Lead Acetate,** is sedative and hemostatic; gr. ss–ij in pill with Opium, very useful to check hemorrhage and allay pain (R). **Turpentine,** 5 to 10 drops frequently repeated in hemorrhage (R). **Resorcin,** acts very well; its analgesic property herein is so marked that the stomach is enabled to tolerate food (Pope). **Glycozone,** is the best of all known agents for the treatment of gastric ulcer (Edson); should be given on an empty stomach, one or two teasp. in a wineglassful of water. **Charcoal** is said to ease the pain by preventing formation of acid products (R). **Mercury,** Corrosive Sublimate an effective remedy, gr. $\frac{1}{60}$–$\frac{1}{30}$ thrice daily before meals (B). **Pepsin,** by facilitating digestion is useful (B). **Iron,** for the anemia; the Lactate or Ammonio-citrate if stomach irritable (Da C). **Ice-bag,** to the epigastrium, for pain and vomiting (R). **Nutrient Enemata,** to rest the stomach; (see under ENEMATA for formula); Brandy may de added, also Laudanum gtt. x–xx, if the rectum is irritable (B). **Milk-cure,** has succeeded admirably (B); a strictly skimmed milk diet with Lime-water, 2 parts of milk to 1 of Aqua Calcis (Da C). **Diet,** should be of non-irritating character, with cold or hot compresses to the epigastrium, leaves little room for medicine: in bad cases nourish per rectum so as to give the stomach complete rest; in any case use such food as is chiefly digested in the small intestine, farinaceous vegetables, rice, arrowroot, etc. A nice change from milk diet is a warmed pancreas, chopped up with rare meat, being nutritious and well relished (Da C). **Rest,** in bed for several months is imperative (Da C). **Defibrinated Blood,** by injection into rectum, in doses of ℥iij–vj (A. H. Smith). [Compare HEMATEMESIS.]

℞. Argenti Oxidi,
Ext. Hyoscyami, . . āā gr. x.
Ft. pil. no. xx. Sig.—One pill thrice daily before meals.

℞. Bismuthi Subcarb., . . ʒ iij.
Morphinæ Sulph., . . . gr. j–ij.
Pulv. Aromat., ... ʒj.
Ft. pulv. no. xij. Sig.—One powder in milk before each meal.

℞. Argenti Nitratis, . . . gr. v.
Ext. Opii, ... gr. iij.
Ft. pil. no. xx. Sig.—One pill thrice daily, after meals.

℞. Argenti Oxidi, ... gr. v.
vel Zinci Oxidi, ... ʒ ss.
Morphinæ Sulph., . . . gr. j–
Ft. pil. no. x. Sig.—One pill thrice daily, before meals.

Gastritis, Acute.

Mercury, Calomel in broken doses with ice, frequently swallowed, for the idiopathic form, which is occasionally seen and cannot be distinguished from that due to irritant poisons (Da C). **Bismuth,** the Subnitrate or Subcarbonate in full doses after the acute symptoms have abated (Da C). **Morphine,** hypodermically for pain (B). **Ice,** internally and externally gives great relief (B

Aliment should be given per rectum; no food, except milk and Lime-water, being admitted to the stomach for some time (Da C). **Antidotes**, in cases of irritant poisoning, as Alkalies to neutralize acids, Dialyzed Iron or the Hydrated Sesquioxide for arsenic, Turpentine for phosphorus, etc. (see POISONING): then Oil, Albumin or milk, to protect the mucous membrane; stimulants, Opium, Ammonia, etc., to antagonize depression of the vital powers.

Gastritis, Chronic.

Arsenic, sometimes surprisingly curative; for the vomiting gtt. j–ij of Fowler's solution before meals (B). **Pulsatilla**, in subacute gastritis of phlegmatic temperaments, white tongue, heartburn, nausea, flatulence, little or no taste (P). **Hydrastis**, gtt. v–xv of tincture or fluid extract, daily before meals, especially for gastric catarrh of acute alcoholism (B). **Nux Vomica**, gtt. j of tincture every 5 to 10 minutes for 8 or 10 doses, in acute gastric catarrh, with headache or sick-headache; also drop or 2-drop doses every 2 hours or oftener, when chronic gastric catarrh occurs in the course of chronic disease (R). **Cinchona**, to promote healthy state of mucous membrane, the infusion with mineral acids, or Quinine; the Red Bark in gastric catarrh of drunkards (B). **Alkalies**, either shortly before meals to stimulate production of gastric juice, or some hours after to neutralize the acids of decomposition (Da C). **Pepsin**, gr. v immediately after a meal, to assist digestion (Da C). **Podophyllum**, in small doses at night, to act on upper bowel; purgation as a method of treatment stands at the head (Da C). **Ipecac**, in small doses may prove useful, ♏v–x of the wine (P); for the nausea and vomiting (R). **Tannic Acid**, in 4-grain doses with a drop of glycerin to make a pill (B). **Bismuth Subnitrate**, is very useful in chronic gastritis, especially that of drunkards, and the chronic gastric catarrh of children with vomiting (R); invaluable for its sedative, alterative and astringent action; 10–15 grain doses several hours after meals (Da C); the Subgallate (Dermatol) is being advertised as a remedy for chronic gastritis. **Bismuth Salicylate**, as an internal antiseptic, is praised in chronic gastric affections. **Strontium Bromide**, gave successful results in 32 cases of gastric catarrh (Sée). **Resorcin**, acts exceedingly well. **Glycozone**, is one of the best remedies for the chronic gastric catarrh of alcoholism, and that from other causes (Edson). **Hydrocyanic Acid**, is much used (R); in subacute gastritis it often proves useful given in an ordinary effervescing draught (Wa). **Silver Nitrate**, in ¼ or ½-grain doses with Opium if pain, or preferably Belladonna, is extremely useful (Da C); to check pain and vomiting (R). **Silver Oxide**, is nearly as good as the nitrate, and not liable to produce staining (Da C). **Opium**, or **Morphine**, to quell pain in chronic gastritis from alcoholic excess (R). **Eucalyptus**, a useful stomachic, not to be used in inflammatory states (B); is used with benefit (R). **Mercury**, the Yellow Oxide, in doses of gr. $\frac{1}{60}$–$\frac{1}{30}$, in chronic form (see under DYSPEPSIA). **Calumba**, and other bitters are useful (B). **Ammonium Chloride**, in high repute in Germany (B). **Caffeine**, especially when associated with migraine (B). **Lead Acetate**, in chronic gastritis with gastralgia and pyrosis, may be combined with Morphine beneficially (B). **Alum**, when vomiting of glairy mucus (B). **Aliment**, such as will be digested in the small intestine; requires careful attention; the milk-cure has been very effective in bad cases; malt liquors are harmful (B); mineral waters of purgative type, to keep the portal system drained: exercise is not beneficial, better live quietly and occasionally spend a day or two in bed (Da C): Kumyss agreeable and tolerant to stomach; the milk-cure and buttermilk have been efficient; the farinaceous vegetables, rice, tapioca, arrowroot, aërated bread. [Compare DYSPEPSIA, GASTRALGIA.]

℞. Sodii Bicarbonat., ... ʒjss.
Tinct. Aurantii Cort., . ℥ss.
Infusi Calumbæ, q. s. *ad* ℥viij.
M. Sig.—Two tablesp. before each meal. In chronic gastric catarrh.

℞. Magnesii Sulphatis, . . . ʒj–ij.
Sodii et Potassii Tart., . ʒss–j.
Ac. Tartarici, ... gr. xx.
Sig.—Dissolve in a glass of water and drink, an hour before breakfast.

℞. Aluminis, ... ʒ ij.
Ext. Gentianæ, ... ʒ ss.
M. Ft. pil. no. xxx. Sig.—Two pills twice daily.

℞. Argenti Oxidi, ... gr. xij.
Ext. Belladonnæ, . . . gr. iij.
Olei Caryophylli, ... gtt. xx.
M. Ft. pil. no. xxiv. Sig.—One pill twice daily. (*Da Costa.*)

℞. Sodii Bicarbonat., ... gr. lxxx.
Spt. Chloroformi, ... ℥ jss.
Tinct. Gentianæ, ... ℥ ss.
Infusi Rhei, ... ℥ iv.
Aq. Menth. Pip., q. s. *ad* ℥ viij.
M. Sig.—A tablesp. or two before each meal. In chronic gastric catarrh with flatulence.

Glanders and Farcy.

Ammonium Carbonate, in water hourly, as concentrated as can be swallowed, followed by an opiate and preceded by an emetic of Ipecac, and an incision into each of Wharton's ducts; proved successfully in a case of acute glanders (Wa). **Carbolic Acid,** and the **Sulphites,** as Sodium Sulphite, are most worthy of trial. **Creosote,** or **Carbolic Acid,** in Glycerin, locally (Wa); or dilute Chlorinated Soda and Lime-water. **Escharotics,** to destroy the affected spot, if inoculation occurs. **Iodine,** internally, also **Arsenic** and **Strychnine,** have been recommended. **Quinine,** in large doses and **Ferric Chloride,** may be useful. **Potassium Iodide,** gr. 150 daily, with baths in Hot Springs of Arkansas, conquered the disease in me, probably the only man who ever survived it. (Dr. Paul Paquin, Univ. Mo.) No drug yet tried has any marked specific effect on the disease (Durham). **Mallein,** for diagnostic purposes (see page 518).

Glandular Affections.

Iodine and **Iodides,** no remedy more efficient, when simple hypertrophy; useless (with all other medicines) when caseation or suppuration has set in; Iodine injected into cystic and glandular growths of neck; Syrup of Ferrous Iodide occupies an important place (B); Potassium Iodide for mammæ and testicles, but especially for thyroid (R). **Iodoform** is equal, if not superior to Iodine, in enlarged scrofulous glands and other glandular swellings (Wa). **Lead Iodide,** as an ointment. **Ung. Hydrarg. Iodidi Rubri,** produces very striking effects in goitre, enlarged spleen, etc. (B). **Sulphides,** especially the Blue Lick water, are said to abort or to mature suppuration in glands (R). **Calcium Sulphide,** for hard, swollen glands behind the angle of the jaw, with deep-seated suppuration (R). **Calcium Chloride,** highly useful in strumous inflammation and suppuration (B). **Pilocarpus,** is curative in acute affections of parotid and submaxillary glands (B). **Mercury,** useful in acute inflammatory states, tonsillitis, parotitis, etc.; Hydr. Chlor. Corr. gr. $\frac{1}{20}$ or Hydr. cum Creta, gr. $\frac{1}{2}$, every two hours (B); the Oleate of Mercury and Morphine in obstinate and painful tonsillitis and inflammation of lymphatic glands (R). **Aurum Salts,** have cured enlarged and indurated cervical glands. **Aurum and Arsenic Bromide,** the solution is highly efficient in cervical adenitis (Barclay); rendered good service in a case of adenitis with enormous enlargement of the left side of the neck (E. A. Wood). **Belladonna,** especially in tonsillitis (P). **Valerian,** with **Guaiacum,** in strumous enlargement (P). **Hydrastis,** frequently controls (P). **Carbolic Acid,** a 2 per cent. solution injected into substance of gland (B). **Electrolysis,** used by me to remove a number of swollen and painful lymphatic glands in the neck (Remak); by the use of strong and often interrupted faradic currents multiple indurated lymphatic tumors have been removed or diminished (Meyer); enlarged glands have been repeatedly cured by [illegible]). [Compare BUBO, GOITRE, PAROTITIS, TABES MESENTERICA, etc.]

Glaucoma.

Atropine, gr. $\frac{1}{80}$ hypodermically is beneficial (Anstie); imprudently used has caused the disease (Graefe, Wells); should not be indiscriminately instilled into the eyes of persons over 35 or 40 years of age, in whom it may light up a latent or incipient glaucoma. **Physostigmine**, lowers intra-ocular tension, and with **Quinine** is indicated in all cases of threatened glaucoma, to preserve the eye from the risk of consecutive glaucoma, and after iridectomy or sclerotomy (de Wecker). **Iridectomy**, the only remedy for the disease, medicine being worse than useless; the operation should be performed as soon as a state exists which can be called glaucomatous; even when vision is lost the operation will best relieve the pain (C): almost a certain cure in early stages, in later nearly always palliative and often curative. **Drainage of Eye**, by gold wire or catgut, has proved successful (de Wecker).

Gleet.

Cantharis, in drop doses, when frequent desire and pain in region of prostate (R); of benefit in subjects of relaxed fibre and feeble circulation (B). **Blisters**, to the perineum, of undoubted benefit (R). **Piper Methysticum**, has cured obstinate gleet (Switzer). **Bismuth**, 1, glycerin 1, water 6 parts, as an injection, often useful in gleet (R). **Eucalyptol**, is used with benefit in chronic catarrh of the genito-urinary tract (R). **Iron**, the tincture of the Chloride, ʒss in Oss of water with ʒj of Laudanum, makes a good injection for gleet (R); internally for anemic subjects (St). **Mercury**, ½ grain of Corrosive Sublimate in ℥vj of water, is a good injection in gleet, used every 2, 3 or 4 hours (R); Donovan's Solution in doses of 10 minims thrice daily, so uniformly successful in controlling chronic urethral discharge as to be almost a specific for gleet. **Zinc Salts**, the Sulphate or Chloride, gr. ij of the latter to a pint of water, as injection every hour (R). **Bougies**, of gelatin, medicated with astringents, are extremely efficient. **Turpentine**, in moderate doses, when due to relaxed condition (R). **Copper Sulphate**, a solution as injection (R); astringent injections may be used with benefit (Wa). **Copaiba**, smeared on a bougie and introduced into the urethra, will sometimes cause gleet to yield (Wa). **Sandalwood Oil**, ♏xv ter die (R). **Glycerite of Tannin**, with equal quantity of Olive Oil or mucilage, as injection, ʒij enough; persevere 8 or 10 days after discharge ceases and do not use at bedtime (R). **Balsams of Peru and Tolu**, **Buchu**, **Canada Balsam**, **Copaiba**, **Mastic**, and **Tannin**, are used with advantage (P, R). Gleet is often kept up by over-treatment, will some time or other come to an end (St). **Diet and Habits** important; stimulants, both solid and liquid, should be rigidly avoided, also coffee; frequent ablutions, fresh air, good nourishment. [Compare GONORRHEA.]

℞. Tinct. Ferri Chlor., . . . ʒvj.
Tinct. Cantharidis, . . . ʒij.
M. Sig.—15 drops in water three times daily.

℞. Zinci Sulphatis, ... gr. iij.
Ac. Carbolici, ... ♏ij.
Ext. Hydrastis,
Ext. Belladonnæ, . . . āā gr. vj.
Gelatini, ... q. s.
M. Ft. bougia no. vj. Sig.—One in urethra at bedtime.

℞. Pulv. Cantharidis, ... gr. iij.
Ol. Terebinth., ... ʒj.
M. Ft. pil. no. xij. Sig.—One thrice daily in obstinate gleet. If strangury occur, stop for a day or two.

℞. Ac. Tannici, ... gr. x.
Bismuthi Subnit., ... ʒij.
Aq. Rosæ, ... ℥vj.
M. Sig.—Shake and use as an injection thrice daily. (*Maury.*)

Glossitis.

Bismuth, gr. xx of Subnitrate with ℥j of glycerin and ℥vij of water, as lotion for erythematous inflammation of the tongue (A). **Purgatives**, with gargles, leeches, antiphlogistic regimen generally (D). **Quinine** and **Iron**, should be given internally, with dilute acid washes, and free purgation (Cl). **Alum**, dry, powdered, may be dusted on tongue (Cl). **Leeches**, applied beneath the jaw, if symptoms are urgent (Cl). **Abscess**, should be opened, if any form. **Incisions**, along superior surface, followed by vapor of hot water, may instantly relieve congestion (A). **Tracheotomy** or **Laryngotomy**, if suffocation is apparently imminent (A).

Glottis, Edema of.

Emetics, when edema slight (A). **Inhalations**, of steam with Benzoin or Conium of great service (A); or of Tannin, grain viij or to ℥j of water; or Alum, gr. x to the ℥, or a saturated solution of Potassium Chlorate, all as spray (Walker). **Ethyl Iodide**, by inhalation, proved curative in one case in which it was repeated twelve times (Sée). **Scarification**, by laryngeal lancet, of paramount value (A). **Tracheotomy**, if the above fail (A). O'Dwyer's laryngeal tubation promises well. [Compare CROUP, LARYNGITIS.]

Goitre.

Iodine, is curative in simple hypertrophy (ordinary goitre) used both internally and externally: deep injection of the tincture is very successful in cystic degeneration of the gland (B); also in the fibrous and fibro-cystic varieties, if injection be made into the tumor; dangerous, if into a vein or into the surrounding areolar tissue (Wa). **Mercuric Iodide**, as oint. assisted by the sun's rays; a piece the size of a large pea rubbed in daily, very successfully used in India for simple hypertrophy (R); the official Unguent. Hydrarg. Iodidi Rubri, 1 in 10, daily (B); is too strong (Gross); gr. xv to the ℥ strong enough for the worst cases (Wa). **Potassium Iodide**, internally, also externally as ointment, in simple hypertrophy of the gland (R). **Strychnine**, gr. $\frac{1}{18}$ thrice daily, has been successful in several cases (Holmes). **Ferric Chloride**, injections of the solution used in thirty-eight cases with curative results (Mackenzie). **Ergotin**, injected with benefit into the parenchyma of the goitre (P); also used hypodermically with good results (Wa). **Ammonium Chloride**, as an internal remedy has proved curative (Stevens). **Thyroid Gland**, ʒj to ij, once a week, cured 4 children completely, and cured or relieved 9 out of 12 cases so treated (Bruns); Thyroid Extract is used with benefit (see page 159). **Electrolysis**, has sometimes cured in cases of simple hypertrophy and cystic gland (B); 6 out of 14 test cases of goitre were absolutely cured by electrolysis (Duncan). **Spongia Usta**, was formerly considered a sovereign remedy (Wa). **Seton**, has cured. **Fluoric Acid**, in doses of ♏xv to ʒj thrice daily, largely diluted, cured seventeen cases out of twenty (Woakes). **Excision**, is a very difficult operation, only to be considered in extreme cases; it has been performed successfully by Desault, Harris, Lane, Hedenus, Billroth and Greene. [Compare EXOPHTHALMOS.]

℞. Ammonii Chloridi, . . . ʒvss.
Syrupi Simplicis, ... ℥ss.
Aq. Cinnamomi, ... ℥iv.
Sig.—Teasp. thrice daily.

℞. Unguenti Hydrargyri Iodidi
Rubri, ... ʒj.
Vaselini, ... ʒvij.
M. Sig.—Use as directed. (*Gross.*)

Gonorrhea.

Aconite, a drop of tinct. each hour in the acute stage (R); when inflammation (Pf, St). **Gelsemium,** serviceable, acute stage (Pf). **Methylene Blue,** in doses of gr. ij thrice daily, given in the earlier stages, will shorten the course of the disease (Horwitz). **Cannabis Sativa,** after acute symptoms subside, a few drops 3 or 4 times a day, is fully as effectual as Copaiba or Sandal and infinitely more pleasant to take (Pf). **Cannabis Indica,** relieves pain, diminishes discharge (P); occasionally useful (R). **Colchicum,** the wine of the seed has frequently cured gonorrhea, and was used in thirty-minim doses nightly for the relief of chordee by Brodie (B). **Ferric Chloride,** when acute stage has passed and the discharge is degenerating into gleet, few remedies are more useful than this tincture in doses of ♏xv–xx thrice daily (Wa). [See ERYSIPELAS for formula.] **Alkalies,** Citrates or Bicarbonates to render the urine alkaline (R); Lithium Carbonate in five-grain doses thrice daily, for the same purpose: Alkalies are the chief factor in Otis's treatment; Potassium Bicarb., gr. x in a tumbler of water or in Flaxseed tea, or Infusion of Triticum with gr. xv of Potass. Bromide if great pain present; Vichy Water (Celestin) freely (Otis). **Turpentine,** in chronic stage when parts are relaxed, moderate doses are of great benefit (B). **Cantharis,** drop-doses may be used (R); in the chronic stage (B). **Pulsatilla,** in subacute and gonorrheal ophthalmia (P). **Copaiba,** especially adapted to gonorrhea (B); pour it upon half a winegl. of water to which add some bitter tincture (Chapman); if given too early in the disease it will aggravate the symptoms (P); should not be used until pain in urinating is nearly gone, chordee ceased and the discharge diminishing and of yellow color (Wa); does no good but is injurious, and prolongs the disease (Otis). **Saw Palmetto,** the fluid extract of the berries of this palm, has been used with good results in doses of ʒj (Porter). **Santal Oil,** is valuable in subacute gonorrhea (P); a good quality difficult to obtain (Pf); the best internal remedy, Copaiba next (St). **Cubeb,** unlike Copaiba, is given with good effect in acute stage; best results from a mixture of both as in electuary (see formula p. 713); is not irritating to the stomach, and agrees with some patients better than Copaiba (Wa). **Balsams** of Peru and Tolu, also Buchu, Uva Ursi, Chimaphila, Pareira, etc., are among the numerous remedies used for gonorrhea (R).

Injections, of Tannin, Copper Sulphate, Iron, Cadmium, Port-wine, Brandy-and-water and 1000 other agents (R); injections are very bad, especially in the acute stage; should never be used until the 5th week and then only if the case is not progressing (Otis); true gonorrhea is never cured in less than four weeks (Van Buren and Keyes); urethritis is a different disease entirely (Otis). **Silver Nitrate,** a weak solution, gr. j–v to the ℥, as injection; in vaginal gonorrhea a strong solution, ʒj to the ℥, through speculum to every part of the canal (B); as abortive injection is useless and dangerous (St). **Argonin** (Silver Casein), is less irritant than silver nitrate and less efficient (Kopp); up to 4 per cent. strength of solution it usually does not irritate. **Largin** (Silver Protalbin), irritates about as much as the nitrate and possesses no marked superiority over the latter salt (Kopp). **Argentamin,** is markedly irritant even in 1 to 4000 solution; no cures resulted from its sole use (Id). **Protargol** (Silver Protein), a few drops of a 20 per cent. solution in glycerin instilled into the fossa navicularis after a suspected coitus, will secure almost perfect immunity from infection (Kopp); in gonorrhea a 1 per cent. solution injected every 30 minutes during the day (Neisser); causes but little irritation and a rather speedy checking of the gonorrheal discharge; on the whole it presents no decided advantage over silver nitrate (Kopp). **Itrol** (Silver Citrate), is strongly advocated by Credé, and seems to possess real merit, its disadvantages are the difficulty of preparing aqueous solutions and the rapidity with which they decompose (Id). **Zinc Salts,** a weak injection of the Chloride, gr. j to ℥vj or viij of Rose-water; or of the Sulphate, gr. j to the ℥, frequently repeated, is probably the best treatment (B); the best injections are those of the Sulphate or Acetate, gr. vj–xij to ℥iv aquæ, after the acute inflammation subsides (St). **Bismuth**, the oleate, smeared on a sound, and inserted for 5 minutes (Shoemaker); with mucilage as an injection, excellent in chronic gonorrhea (Hill). **Lead Acetate**, the dilute solution of the Subacetate, as injection, may be employed at any stage (B). **Chloral**, a weak solution, gr. j–iv to the ℥, a very good injection (Hill). **Resorcin**, a 1 per cent. solution makes a useful injection (Wa). **Antipyrin** 100 parts, Corrosive Sublimate 1, Distilled Water 10,000, used as injection four times daily and retained as long as possible (Vatier). **Boric Acid** ʒiss, Tinct. Iodine ʒij, Glycerin ℥ij, Distilled Water q. s. ad ℥iv, as injection morning and night, has given excellent results in both acute and chronic cases when other treatment proved inefficient (James). **Potassium Permanganate**, a solution of 1 to 1000, one or two quarts at each sitting, washing out the bladder as well as the urethra several times daily, is highly efficient; a solution of 1 or 2 per cent. as injection in chronic gonorrhea (Keyes); a hot solution of 1 in 2000, gradually increased to 1 in 1000, injected into the bladder, in chronic gonorrhea, especially posterior urethritis (Ultzmann); has proved disappointing, both as an abortive agent and for acute gonorrhea (Kopp). **Alumnol**, 1 to 3 per cent. solutions as injections; is reported to be efficient. **Mercury**, excellent results from Corrosive Sublimate (Pf); gr. ¼–½ to ℥viij aquæ destill. in subacute and chronic stages, as injection thrice daily; may have gr. ss–j of Zinc Chloride added with benefit; is often effectual (Wa); the Oxycyanide, in solutions of 1 to 3000 or 1 to 1000, is well tolerated by the urethral mucous membrane; resembles Protargol in action and has no specific power in gonorrhea (Kopp). **Gallobromol**, a 1 or 2 per cent. solution [see page 97]. **Hydrastis**, the infusion best for injection, ʒj of root to ℥viij aquæ (Pf); the fluid extract is one of the best injections, properly diluted; or the Muriate of Berberine (Hydrastin) ʒj to ℥iv mucil. acaciæ (B). **Soluble Bougies** made of Iodoform, Eucalyptus and Cacao-butter, are highly recommended to cut the disease short (Wa); a series of similar preparations, having a basis of gelatin and glycerin, medicated with the usual astringent and sedative drugs, is manufactured by C. L. Mitchell, of Philadelphia and may be obtained of the drug trade. **Wrappings** of several folds of cotton are heating and uncomfortable, also dirty and productive of balanitis, etc.; pin a false front to the shirt for covering (St). **Rest**, in bed is an absolute desideratum, especially during the inflammatory stage. Hot water, 100° F., to the penis during urination, extreme cleanliness, milk diet; water freely as a beverage, flavored with a few drops of Oil of Gaultheria; or Flaxseed tea, or Infusion of Triticum with Potassium Bicarbonate. Sexual thoughts to be entirely avoided (Otis). **Alcohol**, or any other stimulant, must be avoided entirely (R). [Compare CHORDEE, GLEET, ORCHITIS, RHEUMATISM GONORRHEAL, URETHRITIS, URETHRAL STRICTURE, VAGINITIS.]

For Internal Use.

℞. Potassii Citratis, ... ℥ss–j.
Spt. Limonis, ... ʒss.
Syr. Simplicis, ... ℥ij.
Aquæ, ... ℥j.
M. Sig.—Dessertsp. largely diluted, 3 or 4 times daily. As alkali for the increasing stage. (*Otis.*)

℞. Oleoresinæ Cubebæ, . . . ʒiv.
Potassii Bromidi, ... ℥j.
Olei Sassafras, ... ♏x.
Syr. Acaciæ, ... ℥ij.
Aquæ, ... q. s. *ad* ℥vj.
r.—Dessertsp. 3 or 4 times daily. (*J. Wm. White.*)

For Local Use.

℞. Resorcini, ... ʒj.
Ac. Borici, ... gr. xx.
Zinci Acetatis, ... gr. ¼–½.
Aquæ Destil., ... ℥iv.
M. Sig.—Dessertsp. as injection.

℞. Zinci Sulphatis, ... gr. viij.
Liq. Plumbi Subacet. Dil., ℥iv.
M. Sig.—Use as an injection.

℞. Zinci Chloridi, ... gr. j.
Aquæ Rosæ, ... ℥vj–viij.
M. Sig.—Use as an injection.

The Black Paste.

℞. Pulv. Cubebæ, ... ℥iij.
Copaibæ, ... ʒjss.
Aluminis, ... ℥ij.
Sacchari Albi, ... ʒj.
Magnesiæ, ... ʒjss.
Olei Cubebæ, ... ʒj.
Olei Gaultheriæ, ... ʒj.
M. fiat electuarium. Sig.—A piece the size of a walnut after each meal. (*Otis.*)

[For Emulsion of Copaiba see page 572.]

℞. Zinci Sulphatis, ... gr. vj.
Plumbi Acetatis, ... gr. viij.
Ammonii Chloridi, ... gr. iv.
Aluminis, ... gr. v.
Aquæ Rosæ, ... ℥j.
M. Sig.—Injection to be used after acute symptoms subside.

℞. Pulv. Iodoformi, ... ℥ss.
Ac. Carbolici, ... ℥ij.
Glycerini, ... ℥ij.
Aquæ Destil., . q. s. *ad* ℥viij.
M. Sig.—Teasp. as injection.

[For Injection Brou, see page 578.]

Gout.

Piperazin, the best solvent for uric acid; promptly reduces the redness and swelling of the joints in acute gout, remarkably relieves the paroxysm and promotes elimination of uric acid and urates; should be given in doses of 15 grains daily, dissolved in a pint or more of carbonated water. **Lysidin,** is still more powerfully solvent on uric acid [see page 430]; tried in cases of chronic gout with exacerbations with excellent results (Grawitz). **Lycetol,** is beneficial [see page 430]. **Phenocoll,** when much pain and fever; combined with Piperazin, gr. xv of each daily in a pint or more of carbonated water, is very efficient treatment. **Morphine,** hypodermically, as close to the affected joint as possible outside of the red areolar, is miraculous in giving immediate relief. **Antipyrin,** remarkably efficient for relieving the pain as well as prophylactic against future attacks (Marshall). **Aconite,** may certainly relieve pain (P). **Belladonna,** the best remedy effectually and speedily to soothe the pain, also in gout of the stomach; 5-♏ doses efficacious (P). **Potassium Iodide,** especially when pain is worse at night (R). **Colchicum** is merely palliative; ʒj of the wine often removes the severest pain in an hour or two, and soon after the swelling and heat subside (R); it is especially useful in acute and rheumatic gout (B); is not specific, nor a lasting or final remedy for gout, but acts very directly on the pain and inflammation of acute attacks (P); is useful in the bronchitis, asthma, dyspepsia, urticaria, etc., of gouty subjects (R). **Colchicine Salicylate,** is highly efficient in chronic gout [see page 285]. **Strontium Salicylate,** in chronic gouty conditions, appears to be the most valuable drug that we have (W). **Sodium Salicylate,** 10 grains every 2 hours internally, also ʒij in ℥vij of warm water as lotion on lint covered with oiled silk, in acute gout is very efficient treatment. Salicylates do not cure gout, they simply aid in keeping down the diathesis (W). **Ammonium Salicylate** is much better than the sodium salt, which is the worst of all the salicylates; the Strontium salt acts slowly and does not derange the digestion like the others (W). **Cascara Sagrada,** is said to promote the elimination of uric acid to a remarkable extent. **Coffee,** a tincture of green coffee promotes elimination of the poison of gout from the system. **Veratrine,** as ointment to painful joints (R). **Arsenic,** a standard remedy in chronic gout. **Chimaphila,** should prove useful [see page 253]. **Chirata,** in the dyspepsia of gouty subjects [see page 254]. **Cod-liver Oil,** in chronic gout (R). **Sulphides,** as baths in chronic gout, or fumigation with Sulphurous Acid, and bed-clothes exposed to its strong fumes (R); Sulphur waters certainly benefit (B). **Iodine,** painted around joints in chronic gout (R). **Strychnine,** hypodermically for later stage of gout paralysis (R). **Lithium,** the Bromide internally and a strong solution of Lithia to the joints (B); the Bromide is the most efficient agent in combating the disease (Aulde); the Carbonate, in solution, gr. v to the ℥, on lint around gouty enlargements, joints, etc. (R). **Guaiacum,** has long had high repute, and may be given for a long time without injury (Wa). **Rhubarb** with an alkali, regularly during intervals, very serviceable (Halford). **Manganese**, Syrup. Ferri et Mang. Iodidi, ♏x–ʒss, for the cachectic state (B). **Alkalies**, to relieve indigestion, especially Lithium Salts; alkaline mineral waters have long had a deserved reputation (B); Magnesia and its Carbonates often of great service; the latter dissolved in excess of CO_2 an elegant form of administration (Wa). **Alkaline Poultice**, Linseed meal 9 parts to one of Sodium Bicarb. is a useful application (R). **Turkish Baths**, are useful in chronic gout (R). **Carbonated Water** freely, has an exceedingly beneficial influence. **Oxygen**, is used with benefit in cases of deficient oxidation (Br). **Aliment**, farinaceous vegetables and acid fruits; avoid animal or saccharine food, and vegetable proteids as well as animal proteids (Luff). Abstinence from the use of common salt has benefited several cases. A milk diet has improved cases and apparently removed the diathesis (B); entire abstinence from alcoholic beverages; the most injurious wines are port, sherry and madeira. **Local Measures**, the affected limb should be raised, and surrounded by hot, moist flannels; wrap the hands in flannel dripping with water and cover with water-proof bag, to dissolve gouty deposits. **Baths**, are useful, especially hot, steam and Turkish baths, but they do not cure the disease (W). **Exercise**, if there be any cure for gout it is exercise (W). [Compare ARTHRITIS, LITHEMIA.]

Scudamore's Mixture (*Modified*).

℞. Vini Colchici Radicis,
Magnesii Sulphatis, . āā ℥j.
Magnesiæ Optimæ, . . ʒij.
Aquæ Menth. Pip., . . ℥x.
M. Sig.—Tablesp. every hour until it operates on the bowels.

℞. Colchicinæ, ... gr. j.
Ext. Colocynthidis Co., ʒss.
Quininæ Sulphat., . . ʒiij.
Ft. pil. no. lx. Sig.—One pill every four hours. (B.)

℞. Vini Colchici Seminis, . ℥ss.
Tinct. Digitalis, . . . ʒij.
Liq. Potassii Citratis, . ℥ijss.
M. Sig.—A teasp. in water every six hours.

Lallemand's Specific.

℞. Ext. Colchici Acet. (B. P.),
Ext. Opii Aquosi, . āā gr. xv.
Potass. Iodidi, ... ʒiv.
Potass. Acetatis, . . . ʒij.
Aquæ Destill., ... ℥iijss.
Vini Albi, ... ℥ss.
M. Sig.—20 drops thrice daily.

Gums.

Myrrh, the tincture for spongy and ulcerated gums (P); ʒij–iv in ℥iv of water or Infusion of Cinchona, is highly serviceable as a gargle or mouth-wash (Wa). **Alum**, for spongy and ill-conditioned gums, tending to recede from the teeth, whether of mercurial or scorbutic origin (Wa). **Catechu**, a piece dissolved slowly in the mouth is often of service in similar conditions (Wa). **Rhatany**, the powder as a dentifrice, keeps gums in good order (B). **Potassium Chlorate**, gr. ij every four hours for a child of one year, for inflammation of gums in teething (Wa). **Carbolic Acid**, gr. iij ad ℥j aquæ, as lotion in diseases of the gums (Hilditch). **Pomegranate**, the bark an excellent basis for gargles in relaxed gums (P). **Potassium Iodide**, gr. x thrice daily, for periostitis of alveolar processes, marked by looseness of teeth, pain and swelling of gums (Graves). **Sodium Salicylate**, in doses of gr. xv every 4 hours, is highly efficient for the same condition, especially in combination with ♏xv of tincture of Belladonna (Coley). **Iodine**, gr. j ad ℥j aquæ, applied by a brush after each meal to the margin of the gums, for retraction thereof with loosening of the teeth (S); the tincture is a good application in many morbid conditions of the gums. **Zinc Chloride**, a saturated solution applied by cotton to the margins, an excellent astringent tonic. **Tannin**, the glycerite, for spongy and bleeding gums (B). **Carbolate of Iodine**, when fetor (B). **Benzoin**, the tincture a good application (B). [Compare ODONTALGIA, SCURVY, TEETH.]

℞. Aluminis, ... ʒss.
Tinct. Myrrhæ, ... ℥j.
Tinct. Cinchonæ, ... ʒiv.
Mel. Rosæ, ... ℥j.
Vini Albi, ... ℥viij.
M. Sig.—Mouth-wash.

℞. Tinct. Orris,
Spt. Rosæ,
Alcoholis, ... āā ℥iv.
Ol. Amygd. Amar., . . . gtt. ij.
M. Sig.—Violet Mouth-wash.
(*Piesse.*)

Hair.

Rosemary, encourages the growth of hair, mitigates baldness, and is supposed to prevent uncurling in a damp atmosphere (P). **Hydrogen Dioxide** and other preparations of oxygen, are used to "blonde" the hair, for purposes of fashion (Wilson). **Hair-dyes**, comprise Potassium Permanganate, Pyrogallic Acid, Black Oxide of Lead, which are temporary, and the Black Oxide of Silver, which is permanent in its action (Wilson). **Depilatories** usually consist of powders containing Quicklime 3 parts, Sodium Sulphide 1, and Starch 4: a powerful depilatory is Barium Sulphide made into a thin paste with Starch (Wilson): another contains Yellow Sulphide of Arsenic, gr. xx, Quicklime, ℥ss, Starch, ʒij: a very effective one is Barium Sulphide and Zinc Oxide (B). **Sarsaparilla** is stated by Teste to possess the curious property of changing red hair to a light flaxen color, when taken internally for three months. [Compare ALOPECIA, SYPHILIS, TINEA TONSURANS, etc.]

℞. Sodii Boratis, ... ʒiv.
Aq. Ammoniæ, ... ℥j.
Spt. Myrciæ, ... ℥ij.
Aq. Rosæ, ... ℥xiij.
M. Sig.—Shampoo Hair Wash.

℞. Ac. Salicylici, ... gr. xl.
Tinct. Benzoini, . . . ʒss.
Alcoholis, Glycerini, . āā ℥viij.
M. Sig.—Hair Wash.

℞. Ol. Ricini, ... ℥jss.
Ol. Bergamottæ, ... ʒjss.
Ol. Cinnamomi,
Ol. Caryophylli, ... āā ♏vij.
Ol. Lavandulæ, ... ♏xl.
Tinct. Cantharidis, ... ʒj.
Aq. Ammoniæ, ... ʒij.
Alcoholis, . . . q. s. *ad* Oj.
M. Sig.—Hair Tonic.

Hay-Fever.

Arsenic, especially valuable when disease is more of catarrhal than of asthmatic type, 3-minim doses of Liquor Arsenicalis (Mackenzie); as cigarettes, 2 or 3 daily. [See ASTHMA for formula.] **Belladonna**, when nasal secretion is very profuse (B). **Euphrasia**, of decided benefit for the catarrhal symptoms (Pf). **Quinine**, very useful after the more acute symptoms have subsided (R); injected into the nares checks catarrhal discharge and spasmodic symptoms (P); a solution of the Hydrochlorate, gr. iv–viij ad ℥j aquæ, applied locally to nasal mucous membrane by a spray-producer or a brush, will arrest the disease if confined to the nares and fauces (B). **Ipecacuanha**, in hay-asthma (R); is of great value, though the smallest doses cause similar effects (P). **Aconite** is better than Arsenic in true hay-fever (R); has been used with the best results (P). **Grindelia** benefits cases of asthmatic type (B). **Iodides** are very serviceable, locally and internally; large doses until some iodism observed; may be combined with Arsenic (B). **Opium**, especially as Morphine, of great value in any stage, but great danger of the opium-habit (B); the tincture in doses of ♏ij–iij every 2 hours for three doses, then ♏j every 2 hours until the discharge abates, has given excellent results (Wa). **Black Coffee** is highly recommended (P). **Cocaine**, a 5 to 20 per cent. solution of the Hydrochlorate, brushed over the nasal mucous membrane after drying it as far as possible, is the most efficient palliative yet obtained (R); a 4 per cent. solution dropped from a medicine-dropper well into the anterior nares the head being thrown well backward, or sprayed up the nostrils from a small atomizer; gives immediate relief, and though not curative it prevents so much suffering and distress that in no case should it be left untried (Da C). **Ignatia**, the tincture has seemed to benefit some cases, and to influence favorably the course of the disorder (Da C). **Lobelia**, has been found an efficient remedy (Wa). **Adrenal Extract**, has proved very efficient [see page 165]. **Tobacco**, smoking helps some and aggravates the symptoms in other instances; internally ad nauseam it helps, but there are better and safer remedies (Wa). **Removal to the sea-coast** or a barren, mountainous district, gives the only relief to some subjects; though many of the worst cases, hitherto unaffected by medicine, are now relieved by the local application of Cocaine. [Compare ASTHMA, CATARRH, CONJUNCTIVITIS, INFLUENZA.]

For Internal Use.

℞. Potassii Iodidi, ... ʒj.
Liq. Potass. Arsenit., . . ʒj.
Aquæ Cinnam., . . . ℥iv.
M. Sig.—Teasp. every 4 hours.

℞. Ext. Hyoscyami, ... gr. xij.
Potassii Iodidi, ... ʒj.
Potassii Bicarb., ... ʒij.
Ext. Glycyrrhizæ Pur., . . ʒiv.
Aquæ Anisi, ... ℥ivss.
M. Sig.—Dessertsp. every 4 hours until relieved. (*Weber.*)

℞. Liq. Potassii Arsenit., . . ʒj.
Tinct. Belladonnæ, . . . ʒij.
M. Sig.—5 to 10 drops after meals, as a prophylactic.

℞. Tinct. Euphrasiæ, ... ʒjss.
Aq. Camphoræ, . q. s. *ad* ℥ij.
M. Sig.—Teasp. four times daily, for the catarrh.

For Local Use.

℞. Tinct. Iodi, ... ʒj.
Ac. Carbol., ... gtt. x.
Aq. Destill., ... ℥iv.
M. Sig.—For local use with atomizer or post-nasal syringe.

℞. Mentholi, ... ʒj.
Ac. Carbol., ... ʒss.
Zinci Oxidi, ... ʒj.
Ol. Amygd. Dulcis, . . . ℥jss.
Cerati Simplicis, ... ℥ij.
M. Sig.—Apply thoroughly to the nostrils every few hours.

℞. Quininæ Bisulph., ... ʒiij.
Aquæ, ... ℥iv.
M. Sig. — Irrigate the nares, after cleansing with a weak alkaline solution.

℞. Cocainæ Hydrochlor., . . gr. vj.
Aquæ Destill., ... ℥ij.
M. Sig.—5 per cent. solution. A few drops to be instilled into nares while head is lowered. (*Da Costa.*)

Headache, Bilious-sick.

Antipyrin, the most valuable single remedy for headaches; an 8-grain dose for dyspeptic headache, in a little water, at commencement of attack, the patient lying down in a dark room; a second dose one hour after is generally enough, but a third or fourth may be required: sleep generally follows, and there are no unpleasant after-effects. **Acetanilid**, in 4-grain dose, equally effective. **Nux Vomica**, gtt. j of tinct. frequently, when acute gastric catarrh, with headache and nausea (R); gtt. j every 10 minutes, soon after meals, often gives marked relief in sick-headache not of neurotic origin (Smith); drop doses every 10 minutes for an hour cure sick-headache, especially when accompanied by biliousness (M). **Strychnine**, with Aloin and Belladonna, in minute granules, for bilious headache from obstinate constipation, effective if given several times a day for a week or ten days (Roy). **Belladonna**, the extract in doses of gr. [illegible], in similar form. **Iris**, blinding headache in right supraorbital region, with nausea and vomiting, usually the result of hepatic derangement; ♏j every half-hour for three doses, usually relieves promptly (Pf). **Bryonia**, ordinary bilious sick-headache with vomiting (P). **Picrotoxin**, gr. $\frac{1}{20}$ by stomach, in periodical form (B). **Chamomile**, a popular remedy (R). **Salol**, is one of the most efficient dies. **Podophyllum**, in sick headache, with dark bilious diarrhea, nstipation with dark evacuations (R). **Sanguinaria**, when [illegible] to stomach derangement, a few doses relieve (P). **Hydrastis**, from constipated bowels (P). **Mercury**, as Blue Pill, to prevent or mitigate; or small doses, gr. $\frac{1}{100}$, of the Bichloride when headache with light-colored diarrhea (R). **Ammonium Chloride** is an efficient remedy in most forms (Wa). **Sodium Phosphate**, a useful laxative in so-called bilious sick-headache (B). **Potassium Bromide**, a large dose in ordinary or sick headaches (R). **Ginger**, in paste, as counter-irritant (P). **Water**, as cold or hot affusion, or ice-bag to head; hot sometimes best; the purgative waters (as Friedrichshall) before breakfast in a cup of hot water (R); a brisk saline purgative, or small doses of Epsom salts thrice daily, very effectual for frontal headache with constipation (Br). **Nitro-muriatic Acid**, 10 drops of the dilute acid in a winegl. of water before each meal, often an effectual remedy (Br). **Charcoal**, two teaspoonsful stirred in half-glass of water, as a draught, is an efficient remedy for sick-headache with sour stomach and flatulence, etc. [Compare HEMICRANIA.]

℞. Ammonii Chloridi, . . . ʒ iij.
Morphinæ Acetatis, . . . gr. j.
Caffeinæ Citratis, ... ʒ ss.
Spt. Ammonii Aromat., . ʒ j.
Elix. Guaranæ,
Aquæ Rosæ, ... aa ℥ iv.
M. Sig.—Dessertsp. every quarter-hour until relieved. (*Carpenter.*)

℞. Podophylli Resinæ, . . . gr. ij.
Tinct. Zingiberis, ... ℥ ij.
Alcoholis, . . . q. s. *ad* ℥ j.
M. Sig.—Teasp. in a winegl. of water every night at bedtime, or every second, third or fourth night as required. (*Dobell.*)

Headache, Congestive.

Antipyrin or **Acetanilid** (see preceding article). **Aconite**, to reduce the circulation (R). **Veratrum Viride**, at menstrual periods (R). **Belladonna**, relieves cerebral congestion, and distress from light and sound (P); pain over brows and in eyeballs, often due to stomach or uterine derangements, especially in young women; ♏iij of tinct. every three hours (R). **Potassium Bromide**, gr. xv–xx, in ordinary or sick headaches (R); Bromides are useful when nervous system has been irritated, but when exhausted they do harm (Hammond). **Calomel**, gr. $\frac{1}{80}$, every hour for ten or twelve doses, will relieve the headache of syphilis occurring at night (Tr). **Cannabis Indica** is given with uniformly good results in the headache of the climacteric. **Potassium Iodide**, throbbing, intolerance of light, pain passing from back of neck over vertex to brow, nocturnal, tender scalp, almost unbearable; ten-grain doses ter die will cure (R). **Hydrastis**, when constipated bowels (P). **Amyl Nitrate**, for headaches with severe flushing heats at menstruation or climacteric, ♏$\frac{1}{30}$ a sufficient dose (R). **Mustard**, in hot foot-bath, or as poultice to nape of neck in various forms of headache (R). **Water**, cold water poured gently over forehead, sometimes warm water better (R); a very hot foot-bath often effectually relieves (Wa). **Purgatives** are often beneficial, especially when congestive headache arises from suppression of hemorrhoidal discharge, or in persons of phlegmatic habit; Aloes best (Wa); or Colocynth, as derivative, when cerebral hyperemia (Da C).

℞. Ext. Colocynthidis Co., . gr. xij.
Pulv. Capsici, ... gr. iv.
Ext. Gentianæ, ... gr. xxiv.
Ft. pil. no. xij. Sig.—One pill thrice daily; also a 25-grain dose of Sodium Bromide nightly, at bedtime. (*Da Costa.*)

℞. Spt. Ammoniæ, ... ℥ j.
Spt. Camphoræ, ... ℥ ss.
M. Sig.—For a quart of water, in which a handful of common salt has been dissolved. Cork tightly and use locally on lint as an evaporating lotion.

Headache, Nervous.

Antipyrin, is efficient [see under HEADACHE, BILIOUS-SICK]. **Acetanilid**, is very efficient in headache from fatigue (Brodnax); as routine remedies for the relief of headache these agents are much more valuable than bromides and caffeine (Whitla). **Phenacetin**, is used with much success (M). **Cannabis Indica**, ten-minim doses of the tincture thrice daily in the intervals, often curative in bad cases of neuralgic headache; or ¼ to ½-grain doses of the extract (P). [See under HEMICRANIA.] **Belladonna**, ♏iij of tinct. every 3 hours, when pain over brows and in eyeballs, especially when at menstrual periods; also when from over-study or fatigue (R). **Nux Vomica**, if with gastric symptoms (R); is better than Strychnine, and should be given in quarter-grain doses of the extract after meals, combined with Iron and Quinine if patient is chlorotic (Hammond). **Bromides**, are useful when the nervous system has been irritated, but harmful when it is exhausted (Hammond). **Silver Nitrate**, half-grain doses with minute doses of Pil. Coloc. Comp., invaluable in headaches of hysterical women and especially stomach headaches of delicate and literary men (Wa). **Ignatia**, removes clavus hystericus (Pf). **Ammonia**, the Aromatic Spirit (ʒss–ʒij) or the Carbonate (gr. v–x) in nervous headache (B); the Hydrochlorate (gr. x–xx) in bilious and hysterical headaches, especially in hard-worked and delicate young women (Wa). **Amyl Nitrite**, inhaled, when extreme pallor of face (B). **Arsenic**, throbbing supraorbital headache (R); as a nerve tonic stands next in value to Zinc (Hammond). **Cimicifuga**, in nervous or hysterical women, especially at menstrual periods (R); in rheumatic and menstrual headaches (P). **Coffee and Tea**, when from nervousness or exhaustion (R); Coffee especially useful (P). **Caffeine Citrate**, one to two-grain doses in capsule every half-hour, a very effectual remedy for nervous and sick-headache, but causes insomnia if used in the evening. **Guarana**, a very effective palliative, gr. xx every half-hour for three doses (P); ♏xv of the fluid extract every quarter-hour increased to ♏xl will often relieve periodical headaches not of malarial origin (Smith). **Sodium Salicylate**, in small doses, gr. ij–iij every quarter-hour, is very efficient in neuralgic headache (Br). **Phosphorus**, as dilute Phosphoric Acid, in doses of ♏xxx well diluted, thrice daily; or Zinc Phosphide, gr. $\frac{1}{10}$ in pill, ter die, very useful in most forms of nervous headache (Hammond). **Cajuput Oil**, well rubbed in twice daily (P). **Menthol**, locally to forehead in frontal headache (Wa). **Potassium Cyanide**, locally in reflex headaches, as gastric, cardiac, pulmonary, menstrual (B). **Valerian** is of great value in excitable persons (P). **Camphor**, a saturated solution in Eau-de-Cologne rubbed on head, when headache of uterine origin (R); in hysterical females, internally, with Magnesium Carbonate (P). **Podophyllum**, purgative doses often give relief when near menstrual periods, with constipation and dark stools (R). **Zinc Oxide**, two- to five-gr. doses useful (R); a remedy of great value (Hammond). **Bismuth**, the Subcarbonate, in two-grain doses after each meal, often better than Zinc, especially where gastric disturbance (Hammond). **Ether Spray**, for frontal headache, after acute illness or fatigue (R). **Chloroform**, ♏xv–xxx of the spirit internally, often effective (Wa). **Galvanism**, sometimes valuable; the constant current always, avoiding too great intensity lest amaurosis ensue (Hammond). [Compare HEMICRANIA, NEURALGIA.]

℞. Potassii Cyanidi, . . . gr. x–xx.
Aquæ Laurocerasi, . . ℥iv.
M. Sig.—Apply locally on a compress for ¼ to ½ an hour. (B.)

℞. Zinci Phosphidi, . . . gr. iij.
Ext. Nucis Vom., . . . gr. x.
Confect. Rosæ, ... q. s.
M. et div. in pil. no. xxx.
Sig.—One pill after each meal.
(*Fordyce Barker.*)

℞. Extracti Nucis Vom., . gr. iij.
Ferri Reducti, . . . gr. xij.
Quininæ Sulphatis, . . gr. vj.
Ft. pil. no. xij. Sig.—One after each meal.
(*Hammond.*)

℞. Ext. Cannabis Ind. Fl., ʒiv.
Pulv. Acaciæ, ... ℥v.
Syr. Aurantii Cort., . . ℥ij.
Aquæ, ... q. s. *ad* ℥vj.
M. Sig.—Teasp. every 3 hours.

Heart Affections.

Potassium Iodide, the true remedy for the heart; especially applicable in non-compensatory mitral or myocardial diseases, and where there is cardiac debility; restoring energy and vascular tension at first; then by dilating, later on, all the arterioles, it frees the heart from resistance, and enables it to recover its contractile power; also dilating the coronary arteries it furnishes nutrition to the heart itself (Sée). **Strychnine,** in medicinal doses, is said to strengthen the heart-beats (R). **Nux Vomica,** gave speedy relief in several cases of heart-failure in which death was imminent; small doses every ½ hour for four successive doses, then every hour (Bowie); in a case of cardiac hypertrophy and mitral insufficiency, in which death was imminent from heart-failure, one drop of the tincture in a teasp. of water every 5 minutes for 10 doses, then every 10 minutes for 3 doses, continuing at longer intervals, completely restored the cardiac force, and dispelled the accompanying cardiac asthma (Macfarlan). **Digitalis,** acts as a stimulant tonic (P); small doses for sedative action; tonic or physiological doses to create hypertrophy in dilatation (Tr); irregularity of pulse its best indication (R); irritable heart (Da C); the tincture, given without water, is the best preparation; especially indicated in weak heart acting rapidly because of its weakness, and in valvular disease (Wa). **Cimicifuga,** safer than Digitalis in fatty heart (B); its action is strongly stimulating and tonic; it relieves excessive dyspnea when weak heart (P). **Convallaria Majalis,** will usually succeed in all cases in which Digitalis is useful, acting similarly to that drug, but with less reliability; is useful in aortic disease and in others where Digitalis cannot be used (Wa). **Helleborein,** as a substitute for Digitalis [see page 338]. **Adrenal Extract,** is a powerful cardiac stimulant, slowing and strengthening the heart [see page 165]. **Cactus,** is highly praised in functional cardiac affections. **Chloral,** is generally contraindicated in heart affections, but may be used with benefit in neurotic palpitation and in pseudo-angina pectoris. **Morphine,** next to Digitalis, is in general the most indispensable remedy in the treatment of severe heart disease, being by far the most efficient agent for the dyspnea (Strümpell); hypodermically is employed in many cardiac disorders with marked advantage, especially in dyspnea and angina with diseased coronary arteries, mitral regurgitation with its dyspnea and insomnia, aortic disease, etc. **Caffeine,** an excellent cardiac stimulant, and diuretic, gr. ij–v of the Citrate every three hours (Da C). **Arsenic,** for dyspnea from weak heart (R); in all cardiac neuroses it is especially valuable when combined with Iron and Strychnine, and is regarded as indispensable in all forms of weak heart accompanied by pain (Wa). **Aconite,** in the highest degree serviceable to diminish excitement or irritability; is more a remedy for functional derangement than for organic disease (Wa); in pericarditis (R); in nervous palpitations and hypertrophy (P); the heart seldom affected in rheumatic fever if Aconite be used from the start (P). **Veratrum Viride,** as cardiac depressant (B); in chronic cardiac diseases where excessive hypertrophy, *i. e.* when Digitalis is contraindicated (W). **Iron,** useful in various forms, especially anemic disorders and palpitation; also in dilatation and fatty heart, and mitral regurgitation (B). **Hyoscyamus,** in functional derangement from emotion, is specially indicated; requires large doses, ♏xl–lx of tinct., or gr. $\frac{1}{48}$ of Hyoscyamine Sulphate hypodermically (Wa). **Amyl Nitrite,** relieves heart-pains resisting all other treatment (W). **Blisters,** flying blisters over the precordial region, to stimulate action in extreme weakness (R). **Alcohol,** as Brandy when heart suddenly enfeebled by fright, loss of blood, etc. (R). **Ether,** ♏xx hypodermically and repeated soon, is a very promptly-acting stimulant in sudden heart-failure; the compound spirit in ʒj doses for less urgent cases. **Schott Cure,** as practised at Nauheim, is a combination of saline baths containing CO_2 in solution, and a series of graduated gentle exercises; the best results therefrom are obtained in cases of cardiac dilatation due to overwork or worry, but it is also useful in fatty infiltration of the heart (not fatty degeneration) accompanying general obesity (M). [Compare ANGINA PECTORIS, DROPSY, ENDOCARDITIS, PERICARDITIS, SYNCOPE, and the five following articles.]

℞. Ext. Ergotæ Fl., ... ℥iijss.
Tinct. Digitalis, ... ʒss.
M. Sig.—Teasp. thrice daily in enlarged heart without valvular lesion.

℞. Spt. Ætheris Comp.,
Liq. Morphinæ Sulphatis,
(U. S. P., 1870), aa ℥j.
Teasp. as required for dyspnea.

Heart, Dilated.

Digitalis, where much dilatation and hypertrophy of left ventricle without valvular disease; is not contraindicated when aortic disease (R); use in physiological doses (Tr); in simple dilatation gives most favorable results (Wa); very useful in mitral disease, when dilatation of the left ventricle (P); gives miraculous relief, is not sufficiently appreciated, but requires skilful administration; use the infusion in preference to other preparations, a tablespoonful thrice daily, watching its effects (Da C). **Scoparius**, the infusion (Broom-tea), to maintain the kidney action if Digitalis is not sufficient (Da C). **Purgation**, brisk, free, watery stools, next to Digitalis is the best treatment (Da C). **Morphine**, hypodermically, gr. ⅛–⅙ two or three times a week in dilated heart with dyspnea (B). **Amyl Nitrite**, dyspnea from dilatation (R); is useful when great dyspnea, the cardiac asthma (P). **Ether**, the Compound Spirit an excellent remedy for the dyspnea (Da C). **Mercury**, a classical pill and a very efficient one as a diuretic in dropsy from cardiac disease is the combination of gr. j each of Pulv. Digitalis, Pulv. Scillæ, and Hydrarg. cum Cretâ (Foster). **Schott Cure**, in dilatation due to overwork or worry (see preceding page).

Heart, Fatty.

Strychnine, often the first remedy to do good; unduly pushed will produce nervous worry and be injurious (P); is the remedy with Iron, nourishing but not fat-making diet, and wine to keep up the tone of the blood (Da C). **Ergot**, in occasional doses has been given with apparent benefit (Wa). **Iron**, the tincture of the Chloride in small doses for a long time, has been of remarkable benefit (Wa). **Cimicifuga**, safer than Digitalis (B); the latter should not be used (Wa). **Digitalis**, of no value except for very temporary use and for some special indication (Da C). **Chloral**, must be entirely debarred (Id). **Ether**, the compound spirit for sudden attacks of pain or dyspnea (Id). **Amyl Nitrite**, for the same indications (Id). **Stimulants**, freely used, in an acute attack of any kind, afford the only chance (Id). **Schott Cure**, useful in fatty infiltration (not fatty degeneration) accompanying general obesity (M).

Heart, Hypertrophied.

Aconite, often better than Digitalis (R); dangerous in hypertrophy of left side with diseased valves, but useful in simple hypertrophy (P); for overaction with hypertrophy (B); the one remedy which can be depended on: small doses for months, say gtt. j of a good tincture ter die, to lower the heart gradually and keep it low (Da C). **Digitalis**, very useful in pure hypertrophy due to valvular disease or excessive muscular exertion (R); the primary action (small doses) required, as it creates hypertrophy when given in physiological or tonic doses (Tr). **Veratrum Viride**, as a cardiac depressant, gtt. v ter die, will relieve in simple hypertrophy, and irritable heart from abuse of tobacco, inadmissible when valvular lesions exist (B); gives the best results next after Aconite (Da C). **Lead Acetate**, for violent palpitations, in some instances efficient (Wa). **Amyl Nitrite**, for dyspnea, syncope (R). **Ergot**, in enlarged heart without valvular lesion; may be combined with digitalis (B). **Potassium Iodide**, small doses long continued benefit some cases (Wa). **Camphor**, in doses of gr. iij–xij daily for tumultuous palpitations and dyspnea of hypertrophy with dilatation (Wa). **Iron** is necessary where anemia exists (Da C). **Quiet Life** of great importance, no stair-climbing, no long walks; rest in bed for days at a time often of service, moderate diet, avoiding fattening foods, meat and stimulants (Da C).

Heart, Palpitation of.

Aconite, for the fluttering heart of nervous persons and nervous palpitations (R); for over-action with hypertrophy (B); for palpitation with simple hypertrophy (P). **Hydrocyanic Acid**, when from dyspepsia (P). **Iron**, when palpitation due to anemia, a very frequent cause; other causes are tobacco, coffee, tea, etc. to excess, dyspepsia, venery, excessive exercise (Da C). **Spigelia Anthelmia**, when due to mitral and aortic disease, with much dyspnea (P). **Digitalis**, in small doses as sedative (Tr); combined with Iron in palpitation with valvular disease, or given alone in very severe cases (Wa); suits a large number of cases, especially for temporary purposes (Da C); the only remedy of positive service for the actual palpitation (Richardson). **Camphor**, recommended in nervous palpitations (R). **Veratrine**, as ointment to chest, when rapid, irregular pulse, hurried breathing, dropsy and lividity, palpitation, inability to lie down (R). **Nux Vomica**, of great value in nervous palpitation. **Bromides**, in fluttering heart (B); are useful when tolerated by the stomach (Da C). **Hyoscyamus**, in nervous, and violent palpitations from excited state of the brain (P); in large doses, for functional disturbance arising from emotion (Wa). **Belladonna**, in small doses, when irregularity of rhythm; may also be applied externally (Da C). **Valerian**, nervous palpitation, with dyspnea (P). **Eucalyptus**, palpitation and weak heart (B). **Galvanization**, of cervical sympathetic and pneumogastric (B). **Hot Foot-bath**, relieves palpitations (R). **Milk-cure**, has been beneficial in irregular action (B). **Ice**, to the cardiac region, has benefited many cases; is of chief value when patient can be kept in bed, which sometimes becomes necessary (Da C).

℞. Pulv. Digitalis, ... gr. xx.
Pulv. Colchici Sem., . . . gr. xl.
Sodii Bicarb., ... gr. lx.

M. et div. in chart. no. xl. Sig.—One powder at first 3 or 4 times daily, gradually reduced to one at bedtime. For irregular cardiac action. (*Bowditch.*)

℞. Tinct. Digitalis, ... ʒij.
Sp. Ætheris Nitrosi, . . . ℥j.
Liq. Ammonii Acet., q. s. *ad* ℥iv.

M. Sig.—A dessertsp. every 4 hours. If prolonged insomnia with palpitation add of Morph. Sulph. gr. $\frac{1}{16}$ to each dose. (*Richardson.*)

Heart, Valvular Disease.

Nux Vomica, the tincture in one-drop doses every 5 minutes remarkably efficient in heart-failure, even with death impending (Bowie); also for the asthma (Macfarlan). [See under HEART AFFECTIONS.] **Digitalis**, in aortic regurgitation (R); most effective in mitral insufficiency (P); in rapid action with low arterial tension, in mitral disease; infusion best, tablesp. doses twice daily (B); ♏j of tinct. every ½ hour or hour, often gives more relief than larger doses (Smith); when heart is weak and struggling (Da C). **Cactus**, is especially recommended in complicated aortic regurgitation, as it does not prolong the diastole like Digitalis, but stimulates the cardiac action. **Morphine**, hypodermically for the dyspnea, is better in mitral than in aortic disease (R); the agent above all others in aortic insufficiency, combating the two great symptoms therein, the cerebral anemia and the dyspnea; is to aortic regurgitation what Digitalis is to mitral (Dujardin-Beaumetz). **Aconite**, useful for the palpitation, but dangerous in hypertrophy of left side with diseased valves

(P); for cases presenting excessive growth and strong action, diminishes the blood-pressure in the arterial system, and gives great relief (Da C). **Veratrum Viride,** has similar applicability, but is more apt to nauseate; an admirable sedative, and one which does not sicken, is a mixture of Tinct. Aconiti, ♏j, Tinct. Veratri Vir., ♏iij, Tinct. Zingiberis, ♏vij (Da C). **Strophanthus,** is a cardiac tonic like Digitalis, but does not contract the vessels nearly so much (Br). **Nitroglycerin,** is the best of all remedies when actual cardiac pain; it lessens blood-pressure and diminishes the resistance the heart has to overcome (Da C). **Adrenal Extract,** is a powerful cardiac stimulant and may be used cautiously [see page 165]. **Caffeine,** as a tonic and diuretic, of especial value in cases where urine is scanty, with cardiac pains, headache and dyspnea, and weak heart; gr. ij of the Citrate every three hours (Id). **Adonidine,** in doses of gr. $\frac{1}{10}$ to $\frac{1}{5}$ thrice daily, acts excellently as a cardiac regulator (Id). **Barium Chloride,** gr. $\frac{1}{10}$ in pill three or four times daily, is diuretic, lessens cardiac pain, increases tone in the vessels, and is a good general and cardiac tonic (Id). **Purging,** with Jalap, etc., in engorgement of right side of heart (R); occasionally useful (Da C). **Treatment** is directed chiefly to the dilatation or hypertrophy resulting from the valvular disease; the simplest rule is to use one's best judgment as to when the heart needs strengthening by the use of Digitalis or reducing by the administration of Aconite or Veratrum Viride (Da C). [Compare ENDOCARDITIS.]

Heat-stroke.

Quinine, in all fulminating fevers, including siriasis, occurring in warm climates, if malaria be suspected and especially if its plasmodium is discovered in the blood; gr. vij of the Hydrochlorate hypodermically at once and repeated 3 or 4 times at intervals of 4 hours (Mn). **Morphine** to control the convulsions (Bevan). **Chloroform,** by inhalation cautiously, for the convulsions (Mn). **Strychnine,** must be avoided in heat-stroke, there being a tendency to convulsions in this affection (Chandler). **Digitalis,** ♏xl of the tincture hypodermically as soon as possible in siriasis, preceded by a small bleeding in plethoric cases showing high arterial tension (Chandler). **Bromides,** for restlessness and insomnia (Mn); courses of the Bromides and Iodides, with repeated blistering of the neck and scalp, also careful dieting and general hygiene, for persistent headache and other signs of chronic meningitis (Id). **Antipyrin** and other antipyretic drugs are to be avoided in all serious cases of siriasis, as they are dangerous by their depressant action on the heart (Id). **Alcohol** in every form, must be strictly forbidden in any case of heat-stroke in which the cerebral symptoms suggest meningeal congestion or inflammation (Id). **Stimulation** is indicated in the syncopal form, generally called "heat-exhaustion"; Ammonia held to the nostrils and a stimulant given by the mouth or rectum or hypodermically (Id); external stimulation in asphyxial cases to the precordium by mustard, also to the feet by hot bottles, and hypodermics of nitro-glycerin, atropine, brandy, camphor or ether (Anders). **Cold** by ice-bag applied to the shaven scalp for a time in heat-stroke, the bowels kept free, the food light and non-stimulant (Mn); Ice packed around the head and body, iced water dripped on the body from an elevation of 5 to 10 feet for 30 or 40 minutes, a fine iced spray on the forehead for only 1 or 2 minutes; a thermometer in the rectum and the cold application to be discontinued in hyperpyrexial cases when the rectal temperature reaches 104° F., and in cases of simple thermic fever when it has fallen to 102° F., as dangerous collapse may ensue from a longer application; then wrap the patient in a blanket and apply hot bottles to the limbs and trunk (Chandler). **Artificial Respiration,** when the breathing threatens to become suspended, has given marvellous results in some cases (Id). **Climate** should be changed; as soon as the subject of heat-stroke is able to be moved he should go to a cold climate and should not return to the tropics while the slightest evidence of cerebral trouble remains (Mn). [Compare CEREBRAL CONGESTION, MENINGITIS CEREBRAL.]

Hectic Fever.

Quinine, in large doses, gr. xv–xx daily, if stomach and intestines do not rebel (P); given before the paroxysm, to limit it (Roberts). **Antipyrin**, is better than Quinine, but must be used in much smaller dosage than ordinarily employed, say gr. iv or v about ½ hour before fever rises, then doses of gr. ij hourly as long as temp. remains above 100.5°; this daily, will give excellent results in the hectic of phthisis (Pibram). **Phenacetin**, is safer and equally efficient. **Phenocoll**, as an antipyretic, is used with marked success. **Aconite**, in small doses, a remedy of much value in the irritative fever of phthisis (Da C). **Morphine** and other anodynes, are of especial value, given in full doses toward bed-time (Gross). **Prunus Virginiana**, the bark has been found useful, especially when irritable cough (P). **Calcium Phosphate**, is especially useful (R). **Calumba**, excellent for tonic effects (P). **Digitalis**, the tincture, combined with Tinct. Ferri Chloridi, abates the temperature and diminishes the sweats (B). **Iron**, the Mistura Ferri Composita has obtained great celebrity, especially when much debility and anemia (Wa); the Sulphate and Tincture of the Chloride are of especial value in the treatment of hectic (Gross). **Ipecacuanha**, a few grains of Dover's powder at bed-time, will stop the profuse perspirations (Wa). **Salicin**, for profuse perspirations (Wa); as antipyretic. [Compare PERSPIRATION, PHTHISIS.]

℞. Tinct. Digitalis, ... ʒiij.
Tinct. Ferri Chloridi, . ʒv.
M. Sig.—15 drops 3 or 4 times a day. (B.)

℞. Quininæ Sulph., . . . ʒjss.
Elix. Taraxaci, ... ℥iv.
M. Sig.—Teaspoonful every hour for six hours.

Hematemesis.

Ipecacuanha, is decidedly effective in small doses, also when hematemesis is vicarious of menstruation (P, Wa). **Hamamelis**, ♏j–ij of tinct. every 2 or 3 hours (R); effective from its Tannin (B). **Alum**, serviceable in passive hemorrhage; Iron better (B). **Turpentine**, especially in passive hemorrhage with debility (R); and in hemorrhagic transudations on the free mucous surfaces, hematemesis, etc. (B). **Ergot**, has often cured when other means failed (P); most valuable; in urgent cases Ergotin in 2 to 5 gr. doses hypodermically (R). **Iron**, the Subsulphate (Monsel's solution) or Pernitrate, the best remedies; gtt. j–ij frequently, diluted with ice-water (B); the Chloride, in a mixture with glycerin and pounded ice, a teasp. every hour, gave excellent results in two cases of very severe hematemesis (St. George Reid). **Lead Acetate**, especially when gastric ulcer, gr. ss–v (B). **Tannic Acid**, gr. x–xx, when hematemesis from gastric ulcer or obstructive disease of the liver (B). **Gallic Acid**, an extremely useful agent; is best used in combination with dilute Sulphuric Acid (Wa). **Ice**, in small pieces swallowed, a most useful agent, with perfect rest for stomach; when hematemesis from that organ, nutrient enemata must be employed; iced champagne to arrest faintness, if persistent; when moderate the bleeding need not give cause for alarm.

℞. Olei Terebinth., ... ʒiij.
Ext. Digitalis Fluid., . . ʒj.
Mucil. Acaciæ, ... ℥ss.
Aq. Menth. Pip., ... ℥j.
M. Sig.—Teasp. every 3 hours.

℞. Ac. Gallici, ... ʒj.
Ext. Ergotæ Aquosi,
Digitalis, ... āā gr. xx.
M. et div. in pil. no. xx. Sig.—One every 4 hours.

Hematocele, Pelvic.

Opium, or Morphine, if needed for pain, with absolute rest in bed, and a moderately tight abdominal bandage (E). **Hemostatics**, as Gallic Acid, Lead, Turpentine, etc., to arrest the hemorrhage, if it be still going on, combined with opiates, and the use of ice-bags or cold lotions to the abdomen or per vaginam. **Tonics**, as Iron and Quinine, while resolution of the extravasation is going on.

Bromides and **Iodides**, to quiet the action of the ovaries, if the hemorrhage recurs at different periods. **Potassium Iodide**, as an absorbent, may be given with Quinine (Braxton Hicks). **Iodized Cotton**, an excellent application to the cervix uteri in cases of hematocele (Wa). **Leeches**, should be applied early in cases of peri-uterine hematocele; later, except to check inflammation, they are inadmissible (Wa). **Mercury**, gr. $\frac{1}{20}$ of the Bichloride thrice daily, with Iron and Ergot, conjoined with vaginal injections of hot water morning and evening; later in lieu of the mercurial the Syrup of Ferrous Iodide in 20-drop doses thrice daily, was thoroughly efficient treatment in one very bad case of retro-uterine hematocele (Hengst). **Surgical** interference has many advocates, but is criminal in a large majority of the cases (E). If the case does not end in resolution it will terminate in pelvic abscess.

℞. Iodi, ... ℥j.
Potassii Iodidi, ... ℥ij.
Glycerini, ... ℥viij.

Mix and saturate 8 oz. of cotton with the mixture; then carefully dry, and label "Iodized Cotton." [See above.]

Hematuria.

Turpentine, when with constitutional debility (B); in very small doses (R); is often very efficacious (P). [See under HEMATEMESIS, for formula.] **Hamamelis**, has arrested severe cases (R). **Chimaphila**, controls hematuria (P). **Gallic Acid**, the most uniformly successful remedy (B); gr. x–xx every hour or two (Da C). **Sulphuric Acid**, alone or with Gallic Acid, is an efficient remedy (Da C). **Acetic Acid**, in a case of alarming hemorrhage from the bladder, which occurred after an operation for vesico-vaginal fistula, and resisted all other means, an injection of apple-vinegar and ice-water, equal parts, succeeded in arresting it (Ghent). **Quinine**, large doses necessary; cures when intermittent or from malarial infection (B); useful in some cases of intermittent hematuria (R). **Myrtol**, has been used with success in hematuria not due to acute congestion (B). **Iron**, the tincture of the Chloride, ♏x–xx several times daily; in this affection the best form of Iron for internal use (Wa). **Ipecacuanha**, exercises a powerful influence (Wa). [See under HEMATEMESIS.] **Ergot**, by stomach or subcutaneously; may be combined with Ipecac, Krameria, or other astringents (B). **Ergotin**, hypodermically, is far superior for efficacy and rapidity of operation (Wa). **Matico**, the infusion, in doses of ℥ij every 2 or 3 hours, is fully equal to Gallic Acid, Lead, etc. (Thompson). **Ammonium Benzoate**, in 5-gr. doses every 2 hours for the albuminuria and hematuria of scarlatina (Hillier). **Cannabis Indica**, is especially indicated in dysuria and strangury when there is bloody urine (R). **Camphor**, in 2 to 5 grain doses is said to promptly remove the renal hyperemia with bloody, coagulable urine, caused by Cantharis, Turpentine, Oil of Mustard, Copaiba, etc. (R). **Ice** in rectum or to perineum, for vesical hemorrhage (Thompson). **Endemic hematuria**, due to the bilharzia parasite, can only be palliated; as yet we know of no means by which the bilharzia can be destroyed (Mn).

℞. Acidi Gallici, ... ʒss.
Acidi Sulphurici Dil.,
Tinct. Opii Deodor., . āā ʒj.
Infusi Digitalis, ... ℥iv.

M. Sig.—Tablesp. every 4 hours or oftener. In hematuria, menorrhagia, purpura hemorrhagica, and the hemorrhagic diathesis. (D.)

℞. Ext. Ergotæ Fluidi,
Tinct. Krameriæ, . . . āā ℥j.
M. Sig.—A teasp. every hour or tw

℞. Ext. Ergotæ (Squibb), . . ʒj.
Aquæ, ... ʒj.
M. Sig.—For hypodermic use; m
contain gr. j.

Hemeralopia and Nyctalopia.

Strychnine, for night-blindness; small doses gradually increased, of servi (Wa). **Mercury**, Hydrarg. Chlor. Corr. gr. ij ad ℥j aquæ, dropped into the ey twice daily, with blister on each temple, and mild aperients, has cured hemera lopia (Smith). **Quinine**, in as large doses as can be borne, after cathartic and emetic, for night- and day-blindness (Howard). **Blisters**, small, 1½ inches in diameter, close to external canthus of the eye (Bampfield). **Electricity**, occasionally useful (Wa). **Rest**, protection of eyes from bright light, constitutional remedies as indicated by state of the general health, and change of climate, speedily cure hemeralopia. It is sometimes merely a symptom of pigmentary degeneration of the retina, or a feature of scurvy.

Hemicrania.

Antipyrin, the most valuable single remedy for headache, especially in migraine and those cases for which Ergot and Amyl Nitrite are indicated; 5 grains at beginning of the attack often sufficient (Birdsall); of great value in true migraine, employed in twenty cases with unfailing benefit; less useful in the malarial or dyspeptic forms, and useless in uremic (Thompson); one dose of gr. xx, or 2 doses of gr. x each, ½ hour apart, given in the prodromal period, or at the very beginning of a paroxysm, will invariably cut it short within an hour (Sprimon, Ungar, etc.). **Acetanilid** and **Antipyrin**, the striking powers of these two agents are best demonstrated in severe migraine (Whitla). **Phenacetin**, has been given with great benefit, in doses of 2 grains with ½ grain of Caffeine Citrate, for migraine. **Belladonna**, when due to vaso-motor spasm, the face being pallid (B); the tincture in small and repeated doses if the disease be of reflex character (H). **Iris**, in blinding form, from hepatic trouble, right supra-orbital region; ♏j every half-hour for 3 doses, usually relieves promptly (Pf). **Cannabis Indica**, one of the most valuable remedies for megrim or sick headache, apparently acting on the nervous centre whence the disorder springs; is most useful in the intervals to prevent the attacks, and especially when the paroxysms are becoming more frequent; it may be combined in pill with either Iron or Aloes (K); of especial value in the congestive form, the tincture in repeated doses until some physiological action is induced (H); gr. ⅓ of the extract before each meal, increased gradually to ½ or ⅔ grain, in the intervals, kept up for 3 months (Seguin); gr. ⅛ of the solid extract night and morning, very efficient in migraine, if used continuously for a long time (Hare). **Camphor**, gr. iij–v, with a 20- or 30-grain dose of Magnesium Carbonate, is very useful, especially in hysterical females (P). **Croton-chloral**, in milder forms without severe vomiting, headache being predominant; the Bromides are useful after it (R); rarely of any use, but if given it should be in 20-grain doses twice daily (H); **Guarana**, is useful (B), a very effective palliative; gr. xx every ½ hour for three hours (P); its efficacy diminishes by degrees, attacks usually becoming longer (Tr); ʒij of fluid extract in course of an hour or two, to anticipate the attack when expected (Seguin). **Caffeine**, in typical migraine; gr. j hypodermically (P); is especially adapted when chronic gastric catarrh, gr. j every half-hour (B); the Citrate in grain doses every hour for some time before a paroxysm (Wa); gr. j every half-hour often gives marked relief (Smith). **Valerian**, of especial value when hemicrania in excitable temperaments, and after profuse or painful menstruation (P). **Ammonium Chloride**, is exceptionally serviceable; seldom failing to cut short an attack (Austin); 10- to 15-gr. doses (R); as a diffusible stimulant is very efficient, gr. xx up to ʒj every hour during the attack (H). **Sodium Chloride**, in small doses, proved very efficient in six positive cases attended by gastric distress (Rabon). **Podophyllin** or **Mercury**, when of bilious origin (R). **Bromides**, for true migraine; Raspail's Eau Sedative locally, gives great relief (B); when due to uterine disorder (R). **Potassium Bromide**, very serviceable in the paroxysm, also in the continuous form (R). **Eucalyptus**, in cerebral anemia (B). **Digitalin**, gr. $\frac{1}{60}$ bis die in granules for congestive hemicrania (B). **Ergot**, if due to miliary aneurisms of intercranial arterioles; also in congestive migraine and in nearly all kinds (B). **Menthol**, locally in frontal headache due to migraine, is said to be very efficient (Wa). [See formula on next page.] **Piscidia**, recommended (Wa); efficient in doses of ʒij of the fluid extract (Ford). **Arsenic**, for cerebral congestion and hemicrania (B); for throbbing pain in one brow (R); often has the best effect: Watson believed that gtt. iv–vj of Liq. Arsenicalis, 3 or 4 times a day, with due attention to the bowels, would cure 9 out of every 10 cases (Wa). **Aconitine** or **Veratrine**, ointment over brow (R); Aconitine internally is of great service (Seguin). **Phosphorus**, is strongly recommended (R). **Amyl Nitrite**, by inhalation, in migraine with pallor of face (R). **Sanguinaria**, a few doses very successful, when migraine is due to gastric derangement (P). **Ignatia**, removes clavus hystericus (Pf). **Nux Vomica**, when of gastric origin (R). **Cimicifuga**, is strongly recommended (P). **Rubber Bandage**, applied tightly from eyes up, protecting the temporal arteries by pads, or a dry muslin bandage wetted after being put on (Weir Mitchell). **Acupuncture**, the needle run down to the cranium will give relief in clavus hystericus, when nothing else will do so (Pancoast). [Compare HEADACHE, BILIOUS SICK AND NERVOUS.]

℞. Quininæ Sulphatis, . . . ʒss.
Pulv. Belladonnæ, . . . gr. x.
Ext. Digitalis, ... gr. xv.
Ext. Valerianæ, ... ʒss.
Mellis, ... q. s.
Ft. pil. no. xl. Sig.—2 to 10 pills daily, gradually increased, during three or four days before the expected attack.

℞. Mentholi, ... ʒj.
Alcoholis, ... ℥j.
Ol. Caryophylli,
Ol. Cinnamomi, . . . aa ♏xx.
M. Sig.—Apply with finger over seat of pain.

℞. Ammonii Chloridi, . . . ʒvj.
Ammonii Bromidi, . . . ℥iv.
Spt. Ætheris Nitrosi, . . ℥j.
Syr. Pruni Virgin., . . . ℥iij.
Aquæ, ... q. s. *ad* ℥vj.
M. Sig.—Dessertsp. 3 or 4 times daily, conjoined with the use of *Raspail's Eau Sedative* (see page 145), locally.

℞. Aconitinæ (Duquesnel), . gr. $\frac{1}{12}$.
Alcoholis,
Glycerini, ... aa ℥j.
Aq. Menth. Pip., q. s. *ad* ℥ij.
M. Sig.—Teasp. thrice daily.
(*Seguin.*)

Hemiopia.

When established, hemiopia offers little hope of cure, though it has no tendency to progress. In hemiopia scintillans, **Potassium Bromide**, gr. xl–lx daily, or a band of such metal as idiosyncrasy of the patient may decide, with stimulants to ward off the aura; **Quinine, Iron, Hydropathy**, when Potassium Bromide fails (De Wecker).

Hemiplegia.

Strychnine, is most useful when the muscles are relaxed; hypodermically, when paralysis incomplete and the muscles flaccid but not wasted (B). [See PARALYSIS for formula.] **Potassium Iodide**, gr. x–xviij daily, occasionally proves effectual (Wa). **Galvanism**, constant current to the brain or cord, faradic to the muscles opposite those contracted (Hammond). **Physostigma**, prevents muscle wasting, and hence is given with benefit to hemiplegics; gr. $\frac{1}{20}$–$\frac{1}{10}$ of the extract repeated frequently (R). **Massage**, in hemiplegia and other forms of paralysis due to intercranial lesions, when cold and blue skin, wasting and contracted muscles, ulcerations, etc. (B). **Cocculus**, in hysterical, epileptic and choreic hemiplegia, acts well; also in hemiplegia from cold (P). [Compare PARALYSIS FACIAL.]

Hemoglobinuric Fever.

Antipyrin, Phenacetin, and similar antipyretics, are dangerous (Mn). **Quinine**, is less efficient in this than in any other form of malaria (Mn); as it conduces to hemoglobinuria its use is deprecated (Plehn); should be given in this affection if the malarial parasites are found in the blood, but not if they are absent (Bastianelli). **Calomel**, in large doses, 20 to 30 grains, is the favorite remedy in Africa (Mn); Calomel and Jalap, separately or combined, to keep the bowels well open (Copeman). **Chloroform**, in small doses internally; Chloroform ʒj, Pulv. Acaciæ q. s., Sweetened Water, *ad* ℥viij, of which ℥ss every ten minutes until a certain degree of chloroform intoxication is produced, the effect to be kept up by enemata of Chloral; of 22 cases so treated none died (Quennec). **Chloral**, with perhaps small doses of Jaborandi, if uremic convulsions or coma supervene (Copeman). **Tannic Acid**, gr. xv well diluted, every 2 hours for 4 or 5 times, repeated on the third and sixth days to the extent of two doses each day (Mn). **Transfusion** of blood has been successfully practised in high degrees of anemia in some of these cases (Id). **Hot Water**, in bottles in the bed, if the temperature should fall below normal (Copeman). **Diuretics** must not be given if urine suppressed, but hot fomentations to the loins, diaphoretics and plenty of bland diluents internally (Mn). **Milk Diet** exclusively until all albumin has disappeared from the urine (Id). **Care** necessary at all times to avoid getting wet or chilled or over-fatigued, for those who have suffered once from this affection (Id). [Compare MALARIA, INTERMITTENT FEVER, REMITTENT FEVER.]

Hemoptysis.

Atropine, gr. $\frac{1}{100}$ hypodermically, is remarkably efficient in stopping the bleeding in phthisical hemoptysis (Squibb). **Gallic Acid**, exceedingly effective (P); may be combined with Ergotin and Digitalis. [See HEMATEMESIS and HEMATURIA for formulæ.] **Lead Acetate**, with Opium (B); proves signally useful (Wa). **Ergot**, the fluid extract in 30 to 40 minim doses, every 3 or 4 hours, or hourly in severe cases; or Ergotin hypodermically for urgent cases, in 2 to 3 grain doses (R). **Opium**, should be freely used for the attendant excitement (W). **Chloral**, is used with benefit, its vaso-dilator power probably acting as a derivative, and its sedative influence allaying excitement. **Ipecacuanha**, has been highly praised (R); in emetic doses arrests hemoptysis (Tr), though in poisonous doses produces it (P); a well-founded case is recorded where Ergot and Gallic Acid utterly failed, and Ipecac was effectual; but it must be pushed to the nauseating point, in order to effect the control (Squibb). **Turpentine**, in drachm doses every 3 hours, may cause unpleasant symptoms which soon disappear on its discontinuance (R); has proved very efficient (P); after other hemostatics fail it is worthy of trial (Wa). **Alum** is serviceable in purely atonic hemorrhages (Wa); in 10 grain doses every 2 hours (B). **Oil of Erigeron**, is very efficient when no fever or other signs of constitutional irritation (Wa). **Hamamelis**, ♏j–ij of tincture every 2 or 3 hours (R); ♏ij–x of fresh tincture several times a day (Pf). **Ferric Acetate**, a little added to water so as to taste, this constantly sipped (R): Iron spray will often arrest (B). **Digitalis**, has undoubted power over hemoptysis (B); small doses daily (P): infusion in large doses (R). **Arnica**, of great service, if from violence (P). **Aconite**, employed with best results (P). **Sodium Chloride**, half a teaspoonful of common salt, taken dry, repeated till nausea (R). **Sulphuric Acid**, the dilute acid a useful adjunct to other treatment (Wa). **Spinal Hot-water Bag**, to cervical or upper dorsal vertebræ (R). **Auxiliaries**, Cold externally, acidulated drinks, perfect rest, and antiphlogistic diet (Wa).

℞. Ext. Ergotæ Fl., ... ℥jss.
Ext. Ipecac. Fl.,
Tinct. Opii Deod., . . āā ʒij.
M. Sig.—Teasp. every ½ hour.

℞. Plumbi Acetat., ... gr. xx.
Pulv. Digitalis, ... gr. x.
Pulv. Opii, ... gr. v.
M. ft. pil. no. x. Sig.—One every 4 hours. (B.)

℞. Aluminis, ... ʒj.
Sacch. Alb., ... ʒss.
Pulv. Ipecac. Comp., . . gr. xx.
M. ft. pulv. no. vj. Sig.—One powder every 2 hours. (*Skoda.*)

℞. Liq. Ferri Subsulph., . . ♏xx.
Aquæ, ... ℥ij.
M. Sig.—Use as spray by inhalation for 5 minutes every hour.

Hemorrhage, Hemorrhagic Diathesis.

Iron, when hemorrhagic diathesis due to anemia; the tincture of the Chloride preferred (B); this tincture as a styptic (Wa); 1 or 2 teaspoonfuls of the concentrated solution in a glass of water an excellent hemostatic (Tr); the Acetate, just enough to make water taste, in hemorrhage of lungs and kidneys (R). **Ergot**, in uterine hemorrhage of any kind, and many forms of hemorrhage, Ergot or Ergotin of great value (P); not to be relied on alone (B). **Antipyrin**, is a most efficient hemostatic; a 4 per cent. solution checks general oozing from a bleeding surface; as a styptic it constricts the small vessels without causing an external clot to break down (Park). **Gelatin**, as a styptic [see page 127]. **Adrenal Extract**, externally and internally [see page 165]. **Alum**, is sanctioned by high authority (B); dusted on in slight cases (R); in uterine and traumatic hemorrhage, when small vessels open (Tr). **Hamamelis**, ♏j–ij of tincture every 2 or 3 hours, effective in many forms (R). **Ipecacuanha**, produces hemorrhage in poisonous doses, yet has great energy in arresting it (P); exercises a powerful influence on internal hemorrhage generally, and in exhaustion therefrom; gr. j–ij every ¼ hour (Wa); in emetic doses serviceable (Tr). **Turpentine**, few agents more useful in the passive forms (B); small doses in hematuria (R); for serious hemoptysis, and hemorrhage of typhoid (P). **Belladonna**, hemorrhage from rectal ulcers (P). **Digitalis**, in uterine, and many other forms, of great value (P); with restoratives has undoubted power in the hemorrhagic diathesis (B). [See HEMOPTYSIS.] **Bone-marrow**, in hemophilia due to anemia (see page 160). **Gallic** and **Tannic Acids**, in all passive hemorrhages, especially in that of the bladder (P); Tannic Acid for local use, Gallic for systemic effects upon remote parts: when hemorrhage occurs in relaxed and debilitated constitutions, Gallic Acid may be combined with Ergot and Digitalis (B). **Matico**, proves useful in many cases, especially menorrhagia, hematuria and hemoptysis (Wa). **Nux Vomica**, in hemorrhagic diathesis, especially when occurring in anemic subjects; also the Syrup of Iron, Quinine and Strychnine Phosphates; no prescription more generally useful (B). **Aconite**, to reduce the circulation, in epistaxis, hemoptysis, etc. (P). **Cinchona**, internally very efficient in some forms of hemorrhage (Tr). **Copper Sulphate**, in stick, solution or ointment, to arrest hemorrhage from small vessels (R). **Arnica**, in ecchymoses from mechanical violence (P). **Rhatany**, the extract, one of the most powerful hemostatics (Tr). **Hematoxylon**, is devoid of irritant qualities and is therefore well adapted to check the diarrheas and hemorrhages of young children. **Sulphuric Acid**, the dilute acid an excellent internal hemostatic, sometimes very effective in uterine hemorrhage (B). **Dilute Vinegar** to leech-bites, piles, cuts, etc. (R). **Apple-vinegar** as injection for vesical hemorrhage. [See under HEMATURIA.] **Grape-cure**, as tonic for convalescents (P). **Alcohol**, in hemorrhagic diathesis, to elevate the arterial tension (B); Brandy, Wine, when heart suddenly enfeebled by hemorrhage (R). **Venesection**, will promptly arrest pulmonary he orrhage (B). **Styptics**, are either needless or inefficient, hence practically u less in general surgery; hemorrhage should be controlled by either pressure ligation (Roberts). **Hot Water**, sponged over a bleeding surface, is the b agent to stop hemorrhage (Gross). **Transfusion**, when death imminent (**Ice**, internally in wounds or hemorrhage of lungs, or from stomach; sm pieces frequently (R). **Rest**, perfect rest is often indispensable, especially hematemesis, in which nutrient enemata may be required. [Compare DYSE TERY, ECCHYMOSIS, EPISTAXIS, HEMATEMESIS, HEMOPTYSIS, HEMORRHOID HEMATURIA, HEMORRHAGE POST-PARTUM AND INTESTINAL, MENORRHAGI METRORRHAGIA, PURPURA, WOUNDS, etc.]

℞. Infusi Digitalis, ... ℥ij.
Ext. Ergotæ Fluidi,
Tinct. Krameriæ, . . aa ℥j.
M. Sig.—A tablesp. as required in hemorrhagic conditions generally. (B.)

℞. Potassii Carbonat., . . . ʒij.
Saponis, ... ℥j–ij.
Alcoholis, ... ʒiij.
Mix and use as a styptic especially operations about the face. (*Jos. Panco*

℞. Tinct. Benzoini, ... ℥ viij.
Aluminis, ... ℔. j.
Aquæ, ... ℔. x.

Boil 6 hours in a glazed earthenware vessel, adding hot water in lieu of that vaporized, and keeping well stirred; filter, and put up in stoppered bottles. *Pagliari's Styptic.*

℞. Ext. Ipecac. Fl., ... ʒ ij.
Ext. Ergotæ Fl., ... ʒ iv.
Ext. Digitalis Fl., ... ʒ ij.

M. Sig.—Half teasp. to a teasp. at a dose, repeated as required. An excellent anti-hemorrhagic combination. (B.)

Hemorrhage, Intestinal.

Turpentine, should be used (B); especially in that of typhoid (P). [See HEMATEMESIS, for formula.] **Belladonna**, for irritable and bleeding rectal ulcers (P). **Iodine**, in passive form, gtt. j–ij of tinct. frequently repeated, of great service (B). **Sulphuric Acid**, is serviceable (B). **Lead Acetate**, often of great service, especially when used as an enema (Jenner). **Tannin**, one of the most serviceable remedies for the intestinal hemorrhage of typhoid fever (B). **Hamamelis**, very effective in intestinal hemorrhage, owing to its large proportion of Tannin (B). **Ergot**, is most valuable; may be given hypodermically in urgent cases (R). **Gallic Acid**, gr. xv with gtt. iij–iv of Laudanum, in a winegl. of iced water every 2 or 3 hours in the hemorrhage of typhoid (Jenner). **Opium**, a valuable adjunct to astringents, allaying the nervous excitement (Wa); most useful (Da C). [Compare DYSENTERY, HEMORRHOIDS, TYPHOID FEVER.]

Hemorrhage, Post-partum.

Atropine, hypodermically, is remarkably efficient. [See under ABORTION.] **Hamamelis**, for persistent oozing (R). **Ipecacuanha**, in flooding after delivery (R). **Iron**, Monsel's solution, j to iij of water, strong enough and safe as injection (B); the Perchloride diluted (R). **Amyl Nitrite**, ♏v by inhalation, has stopped a hemorrhage promptly and permanently (Kerr). **Ergot**, a full dose of the fluid extract as soon as birth is completed, as a prophylactic (Playfair); hypodermically in urgent cases, gr. ij of Bonjean's Ergotin deeply into the tissues of the arm (Wa); ʒss doses of the fluid extract every 2 to 4 hours in secondary hemorrhage. **Cimicifuga**, will check post-partum hemorrhage, especially when tediously prolonged (P). **Digitalis**, the infusion best; a tablesp. bis die, or in urgent cases every half hour for 4 doses (B). **Nux Vomica**, the tinct. gtt. xx; Ext. Ergotæ Fl. gtt. xxx; each hour for 2 or 3 doses (B). **Opium**, the tincture ʒj with Brandy, in profuse flooding (R). **Vinegar**, a handkerchief soaked in vinegar and carried into the uterus, will often check a severe hemorrhage (Landis); is antiseptic, astringent and sufficiently irritating to produce contraction, yet not so irritating as to cause subsequent mischief, and always acts promptly (Penrose). **Tamponade** by absorbent cotton, plugs of linen, etc., is indicated in hemorrhage from abortion or placenta prævia (Parvin); never tampon after delivery! you might as well hang the woman by the neck (Wallace). **Auxiliary Measures** of importance are firm pressure on the uterus, compression of the abdominal aorta, the plug, and if necessary intra-uterine injections (Wa). **Hot Water**, 110° to 122° F., injected into uterus, extremely successful in checking post-partum hemorrhage (Atthill); the most prompt and certain method, and the least unpleasant to the patient (Parrish). [See also Dr. Cameron in Canada Med. and Surg. Jour., March, 1878, with record of 16 cases so treated.] **Ice**, to abdomen or within the womb (B); into womb or rectum (R); as a prophylactic against hemorrhage and to secure firm contraction of the uterus, a good method is to grasp the womb through the abdominal parietes with a hand kept cold by frequent immersion in a pan of broken ice, while waiting for the expulsion of the placenta; while one hand is kept on the uterus the other may be immersed in the ice. **Transfusion** of milk into veins may be necessary in cases of collapse (Thomas).

Hemorrhoids.

Galls, as ointment, very useful; the official Unguentum Gallæ, or Galls combined with Lead and Opium (R). [Formula on next page.] **Iron**, a solution of the subsulphate as wash to bleeding piles, which should then be well oiled (B); or an ointment of the same (Basic Ferric Sulphate) gr. xv to the ℥, locally night and morning, with gr. j of the salt thrice daily by mouth; gives excellent results. **Hamamelis**, by mouth, also as lotion or injection in bleeding piles (R); is employed with satisfaction; ♏ij–x of tincture several times a day; also as enema or suppository (Pf). **Nux Vomica**, emphatically beneficial (P). **Sulphur**, gr. v–x, with ʒj Confec. Sennæ, as laxative (R); exercises a most soothing influence (Wa). **Sulphides**, especially Blue Lick water (B). **Podophyllum**, as cathartic, for hemorrhoids of recent formation, bleeding from stasis in portal circulation (B). **Aloes**, causes congestion of pelvic viscera, yet Fordyce Barker shows it to be curative in piles, especially in recent ones, as after delivery (B); to greatly relieve bowels (R); cures by removing constipation (P). **Hydrastis**, as lotion or ointment to external piles, of great value; ♏v of tincture ter die internally at same time (P). **Ergot**, with or without Nux Vomica, in dilated hemorrhoidal veins without new tissue, given by the stomach and used locally will often cure (B). [See DIARRHEA for formula.] **Stillingia**, will remove permanently when due to constipation, and temporarily when from hepatic obstruction (B). **Senna**, to procure soft and easy evacuations use the Confectio Sennæ at bedtime, gr. cxx in a bolus (B). **Iodoform**, the ointment, and in suppository (B). **Nitric Acid**, as caustic, followed by free use of Olive Oil (B); ℥ss–℥j ad Oss aquæ as lotion for bleeding piles (R). **Hyoscyamus** or **Stramonium**, leaves bruised or ointment, locally for pain (P). **Linseed Oil**, boiled, in doses of ℥ij twice daily, has quite a reputation as a remedy for piles (W). **Alum**, to painful bleeding piles, a crystal trimmed and passed into rectum, or as an ointment (B). **Ice**, to painful, bleeding piles, or cold water injected daily (B); locally for pain after operation (R). **Leeches**, directly to swollen, irreducible, and painful piles (B). **Alkaline Mineral Waters**, excellent (B). **Carbolic Acid**, 3 parts to 1 of Olive Oil, a few drops injected into the tumor; a favorite and successful treatment by itinerants (Andrews); uncertain in all cases and in many fraught with danger (Gross): a good procedure: use 4 drops each of pure Carbolic Acid and Glycerin, and inject one tumor at a time (Hunt). **Grape-cure**, used with success (B). **Saline Purgatives**, notably Epsom salts, combined with Sulphuric Acid, will often stop the hemorrhage (B). [See DYSENTERY for formula.] **Diet, etc.**, avoid stimulants, indigestible food and over-eating during an attack use little animal food. Petroleum soap when piles protrude with cold or tepid water ablutions. Injections, Oj of cold or tepid water, are very useful. Stool should be at night. **Surgical Methods** are: the ligature for internal hemorrhoids, excision for external ones. **Ligation**, is the proper treatment for the former, all other methods of operating radically being now discarded as unsurgical and dangerous to life (Gross). **Thermo-Cautery** is used by Smith of London and many other surgeons, but is apt to leave behind fissures and ulcers, which are with difficulty healed. **Prevention**, soft seats favor the production of piles, as also of uterine disorders, by pressure on the arteries as they emerge from the pelvis, tending to drive the blood into the interior of that cavity (Holden).

℞. Iodoformi, ... ʒj.
Balsam. Peruv., ... ʒij.
Magnes. Calcin., ... ʒj.
Cetacei, ... ʒss.
Ol. Theobromæ, ... q. s.
M. et fiant suppositoria xij. Sig.—One twice daily (*Potter.*)

℞. Ext. Colocynth. Co., ... gr. xxx.
Ext. Nucis Vom., ... gr. vj.
Hydr. Chlor. Mitis,
Ext. Hyoscyami, . . . āā gr. xij.
M. et div. in pil. no. xij.
Sig.—One pill as required for sluggish bowels. (*Barker.*)

℞. Pulv. Gallæ, ... gr. xx.
Pulv. Opii, ... gr. x.
Ung. Plumbi Subacet., . gr. xl.
Ung. Simplicis, ... ʒj.
M. et ft. unguentum. Sig.—Ointment for piles. (*Œsterlen.*)

℞. Pulv. Gallæ,
Pulv. Opii,
Plumbi Acetat., . . . āā gr. xx.
Ung. Picis Liquidæ,
Cerati Simplicis, . . āā ℥ss.
M. et ft. unguentum. Sig.—Apply night and morning after bathing parts with cold water.

℞. Ext. Opii, ... gr. x.
Pulv. Stramonii, ... ʒj.
Pulv. Tabaci, ... ʒss.
Ung. Simplicis, ... ℥ss.
M. Sig.—Ointment for piles. (*Shoemaker.*)

℞. Ac. Carbolici, ... ʒij.
Ac. Tannici, ... ʒj.
Alcoholis, ... ℥iv.
Glycerini, ... ℥ij.
M. Hypodermic injection for piles. (*Girard.*)

Hepatalgia.

Ammonium Chloride, 20 to 30 grains every 4 hours, is highly efficacious (Anstie). **Bryonia**, worthy of commendation in many liver affections (P). **Nux Vomica**, has been found of much benefit; dose should be small, gr. $\frac{1}{100}$ to $\frac{1}{32}$ two or three times a day (P). **Quinine**, would naturally be thought of for malarial subjects, but does not afford any relief (Anstie).

Hepatic Cirrhosis.

Diuretin, for the dropsy. [See under DROPSY.] **Nitric Acid**, in long-standing diseases, as this will augment flow of bile after liver has struck work from mercury (R); the mineral acids do not benefit (B). **Arsenic**, small doses perseveringly, give good results in improving the nutrition of the organ (B). **Aurum**, the Bromide of Gold and Arsenic has been used with benefit (Barclay); the Chloride of Gold and Sodium, in doses of gr. $\frac{1}{30}$, as an hepatic alterative, may be used conjointly with Sodium Phosphate (B). **Sodium Phosphate** is said to produce good results (Da C); has power to retard the sclerosis, and may possibly arrest the changes and restore a state of comparatively normal function (B). **Iodides**, are the best remedies for the first stage (B); Potassium Iodide is highly recommended by some authorities (Da C); the great measures in the treatment of this affection are Potassium Iodide, hydrotherapy, and a milk diet (Lancereaux). **Stillingia** and **Alkaline Mineral Waters**, are important in the first stage (B); Alkalies early, especially Carlsbad water, with total abstinence from alcoholic beverages (Legg). **Mercury**, Corrosive Sublimate in small doses, gr. $\frac{1}{40}$ thrice daily, for a long time, does benefit the condition and has possibly cured a few cases (Da C). **Tapping** becomes necessary for the dropsy, though purgation and diuresis may help to lessen it (Id). **Diet**, should be of easy digestibility, especially milk, avoiding starches and fats and quitting alcohol (Id). [Compare ASCITES.]

Hepatic Congestion.

Nitric Acid, in chronic congestion, will augment flow of bile after liver has struck work from excessive use of mercury (R). **Nitro-Muriatic Acid**, is found useful in India, with the nitric acid bath, ℥iij ad gall. j, to hypochondrium (B); formerly held high rank but is superseded by Ammonium Chloride; the acid baths being now rarely employed (Fayrer). [See page 566 for formula.] **Sulphates**, in natural purgative waters, small doses often repeated (R); in the shape of some bitter water or of Carlsbad salts, generally give prompt relief (Mn); a good substitute for *Carlsbad salts* is Sodium Sulphate 2, Sodium Bicarbonate 1, Sodium Chloride 1 (Id); Potassium Sulphate is occasionally poisonous (R). **Chelidonium**, as deobstruent (S); energetically affects the liver (Pf). **Iodine**, tincture and ointment locally for hepatic engorgement after malarial attack; also Ammonium Iodide in moderate frequent doses, for functional derangement from malarial disease (B). **Sodium Phosphate**, ʒj–ij, 3 or 4 times daily, in plenty of water, as a purgative (B). **Ammonium Chloride**, in passive congestion, and chronic torpidity, is well worthy of attention; gr. xx every 4 hours (Wa); an excellent remedy (Da C). **Turpentine**, epithems, hot, often found very beneficial (Wa). **Quinine**, gr. xv–xx with Morphine, gr. ¼–½, in the acute congestion due to climatic or malarial causes, no remedy so efficient (B). **Bryonia**, is worthy of commendation in liver affections of various kinds (P). **Iris**, really serviceable when stools clay-colored and skin jaundiced (B); is one of the best aperients in hepatic derangement (P). **Mercury**, valuable only as a purgative; its use restricted to cases where there is deficiency or excess of bile (B); a full Calomel purgative is of utility in cases of congestion (Wa). **Podophyllum**, the resin in congestion of the portal circulation, is especially useful (B); gr. ⅙–¼ every six hours will speedily relieve symptoms (P). **Sanguinaria**, is useful in hepatic engorgement without organic disease (P). **Colchicum**, in hepatic congestion and dropsy; an active remedy in congestion of the liver (B). **Resin-bearing Purgatives**, as Rhubarb, Podophyllum, Iris, Euonymus, etc., are all actively cholagogue. [See list on page 53.] **Ipecacuanha**, decidedly stimulant to the flow of bile (B); is the Indian treatment now for the local liver, given in large doses for a week or two (Da C). **Taraxacum**, has had a reputation, but I cannot recommend it (Id). **Aliment**, no starches or fats; give milk, eggs, oysters, beef-broth, whitefish, etc. (B); in chronic hepatic congestion (tropical liver), alcohol must be forbidden in every shape, animal food used very sparingly, especially beef and mutton, fruit and farinaceous substances may be more freely taken, but over-eating in every form must be avoided (Mn). **Exercise** should be taken twice daily, and should provoke perspiration (Id). **Cold Water Belt** around the abdomen, covered with oiled silk, gives great comfort in chronic cases (Da C). [Compare Biliousness, Jaundice, etc.]

℞. Hydrarg. Chlor. Mitis, . . gr. vj.
Pulv. Ipecac., ... gr. j.
Sodii Bicarb., ... gr. x.
Div. in pulv. no. ij. Sig.—One at bedtime, followed by the following:—
℞. Ac. Nitro-hydrochlor. Dil., ʒ iij.
Elix. Taraxaci Co., . ad ℥ vj.
M. Sig.—Dessertspoonful before meals, and a milk diet.

℞. Ext. Taraxaci, ... gr. lxxij.
Ext. Aloes, ... gr. xxiv.
Ext. Colchici Rad.,
Pulv. Ipecac., ... āā gr. xij.
M. et div. in pil. no. xxiv.
Sig.—2 nightly in chronic enlargement and torpidity of the liver. (*Martin.*)

℞. Sanguinariæ, ... gr. viij.
Podophyllini, ... gr. iij.
Ext. Hyoscyami, ... gr. iij.
Saponis, ... gr. viij.
M. et div. in pil. no. xx.
Si[illegible] ills daily. In hepatic tor-[illegible] disease. (*Phillips.*)

℞. Cinchonidinæ Sulph.,
Euonymini,
Leptandrini,
Juglandini,
Irisini, ... āā ʒj.
Podophyllini,
Ext. Belladonnæ,
Ext. Hyoscyami, . . . āā gr. x.
M. et div. in pil. no. lx.
Sig.—One pill thrice daily. In obstin[illegible] hepatic torpor. (*Blackw*[illegible])

℞. Euonymini, ... gr. xij.
Ext. Hyoscyami, ... gr. vj.
M. et div. in pil. no. vj.
Sig.—One at bedtime, followed ne[illegible] morning by a full dose of an aperient mi[illegible] eral water.

℞. Potass. Bicarb.,
Potass. Citratis, ... āā ℥j.
Syrupi Simplicis, ... ℥ vj.
M. Sig.—A teaspoonful to a table[illegible] with a similar quantity of lemon-juice, [illegible] ½ glass of water; the whole to be dra[illegible] while effervescing. (*W*[illegible]

Hepatic Diseases.

Ammonium Chloride is highly serviceable in all cases of liver disease, whether due to organic changes or to functional derangement; especially indicated after the more acute symptoms have abated (Wa). **Nitro-hydrochloric Acid,** formerly held high rank, but is now superseded by Ammonium Chloride (Wa); even the acid baths, so long considered of great importance, are now but little, if ever, used in India (Fayrer). **Nitric Acid** acts in some way beneficially on long-standing liver-diseases, as in chronic congestion and cirrhosis (R); with vegetable bitters, long continued, useful in waxy liver (Wa). **Podophyllum** has a high reputation in a variety of liver diseases (P); is actively cholagogue (R). **Mercury,** mercurial purgatives are used for both deficiency and excess of bile; harmful in many acute forms of hepatic disease, and generally are of doubtful propriety in liver affections (B); in hepatic congestion a full Calomel purge is of great benefit (Wa). **Red Mercuric Iodide,** as ointment, gr. j to ʒv, gives best results in malarial enlargement of the liver (W). **Calomel** is used in inflammatory disorders of the liver, but is less suited to parenchymatous than to serous inflammations (Da C). **Ipecacuanha** promotes the flow of bile (B); may be used in small doses with great advantage in functional derangement of the organ (Wa). **Resinous Purgatives,** as Leptandra, Iris, Euonymus, Rheum, etc., are decidedly cholagogue (B). **Euonymin** is of great value in torpid liver and its accompanying headache (W). **Bryonia** is worthy of commendation in liver affections of various kinds (P). **Chelidonium** powerfully affects the liver (Pf). **Taraxacum** is highly recommended in all chronic affections of the liver, especially in indolent enlargement and incipient scirrhus (Watson). **Sodium Phosphate** is cholagogue, and extremely useful in liver affections, especially the jaundice of children and hepatic calculi (Thudicum). **Phosphorus** specifically affects the liver, and used early in acute yellow atrophy may have an action of antagonism upon the disease (B). **Potassium Salts,** as depuratives, are of decided value, especially the Citrate, in hepatic torpor and other affections (W). **Sulphur,** the sulphurous mineral waters, prolonged, give excellent results in liver disorders (B). **Alkaline Waters** are very serviceable (B); especially the sulphur waters; Glauber's salt in their place (Da C). **Chlorine Water** has been employed with benefit in chronic hepatic affections, in doses of ʒss–ij in ℥iij or iv of water (W). **Iron** preparations, long continued, in amyloid degeneration (Da C). **Gentian,** and other bitter tonics, in functional disorder; also **Nux Vomica** occasionally, but use Mercurials and Podophyllum sparingly (Da C). **Iodine and Iodides** in waxy enlargement, simple hypertrophy and chronic congestion, of great value (Wa); Potassium Iodide alternately with Ferrous Iodide in waxy liver (Frerichs); a few drops injected into hydatids (B). **Sanguinaria** is of great value in hysteria from chronic hepatitis, and in hepatic engorgement without organic disease (P). **Stillingia** for torpid liver and jaundice following ague, in the first stage of cirrhosis, and in ascites from hepatic changes (B). **Malt Liquors** are harmful in all chronic affections, especially in fatty liver (B). **Galvano-puncture** for hydatids, the negative needle into the hydatid (B). [Compare Lists of Agents acting on the Liver, page 53; also, the articles in this section entitled BILIOUSNESS, CALCULI, CANCER, HEPATALGIA, HEPATIC CONGESTION, HEPATIC CIRRHOSIS, HEPATITIS, JAUNDICE.]

Hepatitis and Hepatic Abscess.

Ammonium Chloride, is almost a specific in hepatitis and abscess of the liver (Stewart); often preventing the latter disorder, and in many instances curing it (Wa); 20-grain doses thrice daily, are usually prescribed (Mn). **Ipecacuanha,** in full doses, repeated once or twice daily for 2 or 3 days, if dysentery be present (Id). **Quinine,** in large doses for the acute parenchymatous inflammation (Da C); in medium doses persistently for a long time has done excellent service in chronic suppurative hepatitis without abscess, but with frequent exacerbations. **Tartar Emetic**, gr. ¼–½, every two or three hours, with Opium or Calomel as indicated by symptoms; of especial value early in the acute attack (Wa). **Leeches** to margin of the anus in the acute type (B); to unload the portal system (Wa). **Mercury** is used, but is better suited to serous inflammations than to parenchymatous ones (W). **Chelidonium** has been used with benefit in both acute and chronic hepatitis (P). **Alkalies and Colchicum**, when the affection is of a gouty nature (Wa). **Sulphites** are recommended in chronic forms (Da C). **Sinapisms** and Linseed poultices over the hepatic region in acute hepatitis (Wa). **Saline Purgatives**, as the Sulphate of Sodium or Magnesium, to increase the watery exudation from the mucous membrane of the intestines, in acute hepatitis (Wa); free purging by the Sulphates, massive hot poultices, low diet and rest in bed, the treatment for hepatitis which has not proceeded to abscess formation (Mn). **Nitro-hydrochloric Acid**, for some time, in the chronic form tending to abscess (Da C). **Aspiration**, when pus forms; early operation the rule of practice; has induced many recoveries (Id). [Compare JAUNDICE.]

Hernia.

Opium, or Morphine hypodermically to narcotism, often obviates the necessity of an operation in strangulated hernia (Wa). **Chloroform**, of evident benefit (Wa); inhaled to assist reduction (R); has superseded the use of Tobacco and Lobelia in strangulated hernia (P). **Coffee**, large doses, has certainly a remarkable influence in aiding or causing reduction of strangulated hernia (Wa). **Thyroid Extract**, causes herniæ to vanish in a few weeks or months when due to accumulation of myxedematous or fatty material in the abdominal cavity, and should be tried in hernial protrusions from any part of the abdomen before resorting to surgical means (Parker). **Oak Bark** extract, as injection into the tissues, for a radical cure by stimulating the occlusion of the rings (Heaton's radical cure): a similar operation was patented by Dr. Gage in 1840, the Oil of Cloves being the injection used; Professor Pancoast injected tincture of Iodine for the same purpose. **Ice Poultice** is of use if no strangulation of gut or omentum (Wa). **Sternutatory**, as snuff or Ipecac, to cause sneezing while patient lies on his shoulders with elevated hips and legs over the back of a chair, frequently successful after taxis has failed to effect reduction; in this position the action of gravity, aided by the sudden action of the diaphragm, tends to draw inwards the posterior portion of the escaped gut, which is the part most difficult to manage by taxis. **Cold Douche**, with taxis properly performed and the position above described, will reduce 90 per cent. of the cases of strangulated hernia within a few minutes (Raiford). **Truss**, properly adjusted, is the best remedy for a reducible hernia, often curing the disease by the pressure of its block (Gross). **Surgical**, Bassini's operation for the radical cure, or some modification thereof, produces very satisfactory results.

Herpes.

Ferrum Arsenate, in doses of gr. ⅛ daily, will effect the cure of a herpetic affection in the adult, however extensive or long established (Duparc). **Mercury**, Calomel ointment, ʒj to the ℥, is one of the best mercurial preparations (Pereira). **Potassium Carbonate**, as lotion, gr. xxx to Oj, to allay irritation (Wa); or as ointment, gr. xx to ℥j, smeared over eruption at night, and washed off in the morning with a solution, gr. xxx to Oj (Neligan). **Myrtol**, is curative of herpes (B). **Glycerin**, diluted, is a serviceable application in herpes labialis (Wa). **Ergot**, the Oil prepared by the action of Benzin upon Ergot, which, upon evaporation of the solvent, makes a valuable application in her[illegible]alium and other skin affections (Shoemaker). **Alum**, in herpes [illegible]tion of ʒj to ℥j; aquæ, applied on lint to the glans penis, is [illegible] (Wa). **Collodion**, the flexible form, is applicable to various kinds of herpes (Wa). **Magnesium Citrate**, as a cooling laxative, with soothing and protective lotions and ointments, and the **Liquor Picis Alkalinus**, diluted 10 to 20 times, for the itching (Bulkley). **Astringent Lotions**, of Tannin or Zinc Sulphate, in herpes præputialis, to render the parts less sensitive (Da C). [For Herpes Circinatus see TINEA CIRCINATA.]

℞. Tragacanthæ, ... ʒ ij–iv.
Liq. Calcis, ... ℥ iv.
Glycerini, ... ℥ j.
Aquæ Rosæ, ... ℥ iij.
M. Sig.—Ointment.

℞. Acidi Carbolici, ... gtt. v–xv.
Pulv. Calaminæ Præp.,
Zinci Oxidi, ... āā ʒ ss–j.
Ung. Aq. Rosæ, . . . ℥ j.
M. et ft. unguentum.

Herpes Zoster.

Rhus Toxicodendron, very readily subdues, especially when burning or itching (P). **Aconite** and **Opium**, locally for pain (Wa). **Morphine**, the oleate externally without friction (R); hypodermically to mitigate the pain (Anstie). **Celandine** has been recommended (P). **Dulcamara**, has an old reputation (P). **Silver Nitrate**, painted on the warning patch of erythema, before or as soon as vesicles begin to form (R); as a local application is reported on favorably (Wa). **Veratrine**, as ointment, gr. xx–xl to the ℥, in neuralgia following shingles (R). **Zinc Phosphide**, gr. ⅓ every 3 hours, is said to control the pain and abort the eruption (Hughes). **Grindelia**, is reputed to relieve the pain (Stillé). **Mercury**, the Ung. Hydrarg. Ammoniat. is said to relieve the pain and irritation remarkably (Wa). **Blisters**, for subsequent neuralgia (R). **Hot Fomentations** will often disperse (R). **Baths** daily, exercise out of doors, abundant nutritious food. **Flexible Collodion**, constantly reapplied to exclude air (Anstie). **Galvanization** of the affected intercostal nerves, the positive pole over their points of emergence, the negative brushed over the terminal filaments of the skin (B). **Starch**, dusted over the eruption, and on a muslin band sewed tightly around the body to protect it from the friction of the clothes, gives the greatest relief (Bulkley). **Rest**, absolute, when eruption is extensive (Fournier).

℞. Zinci Phosphidi,
Ext. Nucis Vomicæ, āā gr. x.
M. et div. in pil. xxx. Sig.—One every 2 to 4 hours, as a nerve tonic. (*Bulkley.*)

℞. Liq. Sodii Hypochlorit., ℥ iv.
Aquæ, ... ℥ ij.
M. Sig.—Wash for ulcerated vesicles.

℞. Bismuthi Subnitratis, . ʒ iv.
Hydr. Chlor. Mitis,
Zinci Oxidi, ... āā ʒ j.
M. ft. pulvis. Sig.—To be dusted on cotton-wool, and applied to the ulcerated vesicles, after washing with the solution of Sodium Hypochlorite. (*Fournier.*)

Hiccough.

Morphine, hypodermically, often arrests hiccough (R); an injection of Morphine and Atropine together has stopped a most violent hiccough in which morphine alone and other agents had proved unavailing. **Nux Vomica**, in 5 or 10 minim doses of the tincture, with ♏xv of dilute Nitric Acid; a short course frequently curative (P). **Chloroform**, combined with Opium (R). **Pepper**, gr. ij–x, to stop hiccough (P). **Laurel-water**, a useful remedy, ♏v (P). **Camphor**, has been recommended (R). **Mustard**, ʒj infused in ℥iv of hot water has cured most obstinate cases (R). **Pilocarpine**, gr. $\frac{1}{36}$ of the Muriate, has cured bad cases which resisted all other means (Ortille). **Ether**, as spray to the epigastrium for ten minutes, then to the site of the phrenic in the neck (Regoni); or the spirit, ♏xx–xxx in some aromatic water, given internally, will often arrest the spasm immediately (Wa). **Zinc Valerianate**, gr. ¾, with a small portion of Ext. Belladonnæ, cured a severe case of fifteen days' duration (Danet). **Nitro-glycerin**, sometimes arrests (R). In mild cases deep inspirations, holding breath as long as possible, or a firm belt around epigastrium (T).

Hydrocele.

Iodine, injection of the tincture 1, water 2, into the sac to excite obliterative inflammation, the usual procedure for radical cure after tapping the sac (Wa); may be used full strength, or with equal part of water; the latter the safest method in ordinary cases, but relapses are not infrequent (Gross). **Carbolic Acid**, ʒss, with a minute quantity of water or glycerin to render it fluid, injected into sac and manipulated to bring all portions under its action, after which rest in bed and support to scrotum (Levis); a very efficient method for radical cure, but may cause erosion of vessels and hemorrhage into sac (Gross). **Ammonium Chloride**, as discutient lotion to the scrotum in hydrocele of children (Wa). **Galvano-puncture**, a current of 20 to 40 elements, by two needle electrodes, will invariably cure (B). **Operations** for radical cure include that by iron-wire sutures to excite adhesive inflammation (Simpson), and the incision of the hydrocele under antiseptic precautions (Volkman); the same end may be obtained by the simpler methods of injection noted above (Gross). [Compare DROPSY, ORCHITIS.]

Hydrocephalus, Chronic.

Mercury, holds a high place in the opinion of many; Calomel gr. ¼-⅓ twice daily, with mercurial inunction to the shaved head, or the latter alone; child to wear a woolen cap; this treatment for 30 or 40 days (Wa). **Ferrous Iodide**, with Cod-liver Oil, always gives good results among the poor (Wa). **Iodine**, as lotions. [See MENINGITIS, TUBERCULAR.] **Potassium Iodide**, may arrest progress (Wa); is of value certainly; appears to have power of promoting absorption (Wa). **Cod-liver Oil**, sometimes improves the condition, especially in scrofulous children (Wa). [Compare DROPSY.]

Hydrophobia.

Belladonna, in all hyperemic states of the brain and spinal cord, is one of the very best remedies (P). **Stramonium**, is used by Brahmins in India with apparent success. **Glonoin**, may be of benefit (Wa). **Nicotine**, rightly used, will probably prove to be our best remedy (B). **Amyl Nitrite**, should be fairly tried (B). **Hydrastinine**, is used with benefit, in grain doses of the Hydrochlorate, hypodermically. **Curare**, is encouraging, gr. ⅓ injected, 7 doses in 5½ hours, dispelled the symptoms, but replaced them by paralysis of the limbs continuing for over 2 months (Ros); has seemed to antagonize the convulsive phenomena (B). **Morphine**, chiefly palliative; for deep injection into the tetanized muscles (B). [See TETANUS.] **Coniine**, is indicated; has not succeeded (B). **Cauterization**, with hot iron or Caustic Potash after cleansing wound, which should be kept open by Unguentum Basilicon for 5–6 weeks (Ros); with Silver Nitrate sharpened to a point, and applied freely to every sinuosity of the wound as preventive (Wa). **Excision**, the safer practice (Wa). **Baths**, warm and hot, produce calm (Ros). **Rabies Toxin**, the Pasteur inoculation with a modified virus, protects the bitten person from the disease. [See page 517.]

Hydrothorax.

Diuretin, has been employed with benefit. [See under DROPSY.] **Digitalis**, in the purely dropsical form, also in passive pleuritic effusions; used as a diuretic, ʒj-ij of infusion bis die or oftener, of great value (R). **Elaterium**, unquestionably of value as a derivative, though many fear it (P). **Jaborandi**, produces good results (B). **Iodine**, ʒj of tincture injected in returning hydrothorax (B). **Sanguinaria**, has been used with the best effects (Wa). **Blisters**, [illegible] taken place, certainly seem to stimulate the absorbents to [illegible] pping, over the chest, gives relief (Da C). **Thoracentesis**, [illegible] mpare DROPSY.]

Hypochondriasis.

Arsenic, in the aged, gives great comfort, especially when combined with Opium (B). **Ignatia**, is useful, the tincture best (P). **Cimicifuga**, of singular value in puerperal hypochondriasis, and that accompanying spermatorrhea, etc. (P). **Aurum**, the Chloride, gr. $\frac{1}{20}$ to $\frac{1}{80}$ ter die gives excellent results, when depression, vertigo, cerebral anemia (B); Gold is an efficient remedy in hypochondriasis accompanying hepatic or testicular disease. **Valerian**, quickly relieves the flatulence of hypochondriacs (B). **Asafœtida**, especially indicated in cases marked by flatulence and gloom (B). **Potassium Bromide**, especially among female town-dwellers, but also in male (R); effects are variable; relieves some, not others (Wa). **Hyoscyamus**, when syphiliphobia (P). **Opium**, stimulant doses of the tincture are of great importance (B). **Caffeine**, the Citrate, gr. j–v, has been used as a cerebral stimulant with advantage (B). **Alcohol**, gives temporary relief in hypochondriasis; should never be given for its narcotic or stimulant effects in these cases (W). **Cocaine**, especially useful in cases marked by debility and nervousness, and in mental affections accompanied by depression; the fluid extract of Coca may be used, either alone or in wine (Br). **Turkish Baths**, are useful for town-dwellers, with soft, flabby tissues and mental depression (R). [Compare MELANCHOLIA.]

Hysteria.

Antipyrin, for the painful affections of hysteria. **Aurum**, the Bromide is of decided benefit, in doses of gr. ¼ to ½ (Rosenbach). **Arsenic**, lessens mobility of the nervous system and improves nutrition (B). **Opium**, gtt. j of Laudanum with gtt. ij of the tincture of Nux Vomica, 3 or 4 times a day, for the flushes, weight on the head, depression, etc. (R); Opium is a useful agent if its identity be concealed from the patient, otherwise the opium habit is sure to follow. **Ignatia**, useful in many forms of hysteria, with feeling of suffocation, sensation as of a ball rising to the throat, convulsive crying, flatulence, etc. (P). **Camphor**, in hysterical excitement (P). **Musk**, for many anomalous and distressing symptoms (R). **Chamomile Oil**, in the spasmodic and pseudo-neuralgic affections of hysterical women, a very excellent remedy (P). **Cimicifuga**, in hysterical chorea, is rapidly curative (P); for the headache (R). **Asafœtida**, in hysterical convulsive affections, with flatulence and cough (P); arrests paroxysm, valuable for flatulence (B); removes headache, peculiar sensations in head, and flatulence (R). **Valerian**, has great value, ʒss doses of fluid extract (B); useful in most cases, especially those of hysterical dyspepsia (P). **Zinc Valerianate**, especially at the climacteric age, for hysterical symptoms which can be traced to no particular cause (R). **Ergot**, with Iron and tonics (formula on next page), in cases depending on sub-involution of the uterus, with indigestion and anemia (B). **Nux Vomica**, of great use in middle-aged subjects, when flatulence, weight on head, flushing and perspirations (R). **Atropine**, for hysterical aphonia, gr. $\frac{1}{120}$ to $\frac{1}{80}$ morning and evening (B). **Ether**, for the flatulence, and for the hysterical paroxysm in sudden seizures (B). **Ammonia**, the aromatic spirit for the acidity and eructations (B); the fetid spirit for flatulent colic, etc., may be given with great advantage in doses of ʒss–j (Wa). **Potassium Bromide**, gives control and prevents paroxysms; when verging on nymphomania large doses required (R). **Iron**, a course often useful, especially when anemia or uterine obstructions (R). **Phosphorus**, in hysterical paralysis (R). **Orchitic Extract**, is used with benefit. **Cerebrinin**, is employed with good results (Paul). **Ovarian Compression**, has in many cases relieved recent hysterical contractions, and many other similar phenomena (Bourneville). **Electricity**, for aphonia, paralysis and anesthesia, and to educate the nervous control; is the sworn enemy of hysteria. **Accessory Measures**, occupation of mind and body; removal from influence of friends; complete abandonment of the use of alcohol; the shower-bath or cold-bath, as an educator of the will as well as to invigorate the body; excitement to be avoided. The word *Hysteria* should never be applied to the case in the patient's hearing. Disorders of vision are often found at the bottom of hysteria; look for hypermetropia and astigmatism.

℞. Ext. Ergotæ, ... ʒj.
Ferri Sulphatis, ... ʒss.
Ext. Nucis Vomicæ, . . . gr. viij.
Hydr. Chlor. Corros., . . gr. ss.
Fiant pil. no. xxx. Sig.—One pill thrice daily. For the indigestion and anemia of hysterical subjects. (B.)

℞. Tinct. Asafœtidæ,
Tinct. Valerianæ Ammon.,
Tinct. Castorei, . . āā ℥ij.
Aquæ Camph., ... ℥vij.
M. Sig.—A tablespoonful or two every hour.

Ichthyosis.

Zinc, the ointment or glycerite of the Oxide, especially the latter with a little Camphor added to it, is a most useful application (Wa); an ointment of the Sulphate, ʒj to ℥j, found very efficient (Wilson). **Sodium Bicarbonate**, as ointment, gr. xv–xxx to the ℥, or lotion, ʒij–iij to the pint (Devergie). **Copper Sulphate**, gr. x ad ℥j of Unguentum Sambuci, a useful application (Wilson). **Ulmus**, in decoction, used internally, has cured the disease (Wa). **Cod-liver Oil**, applied locally with friction, has proved promptly curative. **Warm Baths**, may generally be employed with benefit (R); alkaline and vapor baths, with Sapo Mollis; and inunctions of oil or simple ointment to prevent fissuring of the new skin (Duhring); frequent alkaline baths, with internal and external use of oily preparations, as Linseed and Cod-liver oils, yield the best results (Bulkley). **Thyroid Extract**, has been given with benefit.

Impetigo.

Salol, locally, as an antiseptic and deodorant powder. **Arsenic**, is very useful (see under ECZEMA); the Iodide in doses of gr. $\frac{1}{10}$ has been employed with great success; or Donovan's Solution, ♏v–x (Wa). **Nitric Acid**, internally, frequently benefits (Wa). **Glycerite of Tannin**, an excellent application (B); during the day, with poultices at night to remove scabs (R). **Quinine**, and **Mineral Acids**, when from imperfect digestion (R). **Zinc**, the ointment of the Oxide, after subsidence of inflammation (R). **Sulphur**, internally, serviceable (R). **Calcium Chloride**, gr. xv–xxx, daily in some vegetable infusion, is well spoken of (Wa). **Mercury**, Citrine Ointment diluted, locally, is an excellent application (Wa); a very weak White Precipitate Ointment answers best in impetigo contagiosa, with a little Carbolic Acid lotion, 1 in 20, if it does not yield (Bulkley); Calomel to cover the floor of the pustules, after opening, evacuating and washing them out (Da C). **Laurel-water**, relieves the itching (P). **Grape-cure**, has proved excellent (P). **Flexible Collodion**, or Liquor Guttæ-perchæ, to cover the pustules, if located where they are liable to irritation (Da C). [Compare ECZEMA.]

Impotence.

Phosphorus, no remedy more efficient; the pill of Zinc Phosphide the mos convenient form (B); gr. $\frac{1}{10}$ thrice daily. **Phosphoric Acid**, full doses, with gr ss of Pulvis Cantharidis, an effective combination, especially in impotence of old age (B). **Aurum Chloride**, prevents decline of sexual power (B); Gold salts are highly praised by several authorities for decline of sexual power in men. **Kola**, as a general tonic. **Cantharis**, with Iron is beneficial (B); in large doses, gtt. xx–xxx, with Iron and Phosphoric Acid or Nux Vomica (R); of doubtful efficacy (Wa). **Cubeb**, removes functional trouble (B). **Nux Vo** [illegible] es of tincture in atonic impotence (B); in large doses whe
[illegible] **Sanguinaria**, has decided aphrodisiac properties, but is
[illegible] ctional form (B). **Serpentaria**, in relaxation and feebl

erections, will often restore power; ʒss doses of tincture twice daily (B). **Ergotin**, hypodermically about the dorsal vein of penis, when its enlargement and too rapid emptying is the cause of impotence (B). **Cannabis Indica**, is a useful remedy; the best combination for functional impotence would be one of Cannabis, Nux Vomica and Ergot (B). **Polygonum Hydropiperoides**, is a useful remedy in the functional form, erections feeble, semen watery and testes soft (B). **Ferrum Arsenate**, acts as a tonic to the organs, and in full doses often benefits cases of functional form (B). **Damiana**, has been brought forward as a genital stimulant and a remedy for impotence, but there is probably no ground for any confidence in such claims (Stillé). [Compare EMISSIONS, SPERMATORRHEA, also the List of Aphrodisiacs, *ante*, page 40.]

℞. Ferri Arsenatis, ... gr. v.
Ext. Ergotæ, ... gr. xxx.
Ft. pil. no. xxx. Sig.—One twice daily.

℞. Ext. Cannabis Indicæ, . . gr. x.
Ext. Ergotæ, ... gr. xl.
Ext. Nucis Vom., ... gr. x.
Ft. pil. no. xx. Sig.—One pill night and morning.

℞. Quininæ Sulph., ... gr. xxx.
Strych. Sulph., ... gr. ss.
Ext. Ergotæ, ... gr. xv.
Mas. Ferri Carb., ... gr. xlv.
M. Ft. pil. no. xxx. Sig.—One pill 2 or 3 times daily.

℞. Sanguinariæ, ... gr. ij.
Ext. Ergotæ, ... gr. xx.
M. Ft. pil. no. xx. Sig.—One pill thrice daily.

℞. Tinct. Sanguinariæ, . . . ʒiij.
Ext. Stillingiæ Fl., ... ʒv.
M. Sig.—15 to 20 drops in water, thrice daily.

℞. Phosphori, ... gr. ss.
Ext. Nucis Vom., ... gr. vj.
Mas. Ferri Carbonat., . . gr. xl.
Ext. Gentianæ, ... gr. xxx.
M. Ft. pil. no. xxv. Sig.—One pill 2 or 3 times daily.

Inflammation.

Aconite, is especially indicated in inflammation of the respiratory organs, in the eruptive fevers, and all inflammatory states of high temperature and sthenic reaction; not in adynamic states, or continued fevers, except for hyperpyrexia; may be advantageously combined with Opium (B); gives most brilliant results in many forms (R): always indicated in early stages of simple inflammatory fevers, in all inflammation of serous membranes, pneumonia, tonsillitis, acute rheumatism, erysipelas, etc.; is especially adapted to the uses for which bleeding was formerly employed (P). **Arnica**, is antipyretic, large doses, ʒss of tinct., in sthenic, small doses, ♏x, in asthenic inflammation (B); in inflammation of serous membranes it has given good results (P). **Belladonna**, in many forms no remedy more useful, notably scarlet fever, erysipelas, low fevers; for inflammation of the eyes, boils, carbuncles, etc., Atropine externally, Belladonna internally; when much fever, may be combined with Aconite (B); both locally and internally in inflammation of the eye; is effectual in inflammation which threatens to end in abscess (R); in erysipelas, inflammatory sore throat, encephalitis, gouty and rheumatic inflammation, cystitis, pneumonia, etc. (P). **Gelsemium**, especially for inflammation of lungs and pleuræ, and in pneumonia, ♏v–x of fl. ext. every two hours (B); in acute stage of gonorrhea is valuable (P). **Bryonia**, exceedingly valuable in pleurisy and other serous inflammations, especially pericarditis; after the aconite stage (P). **Veratrum Viride**, when much delirium and arterial excitement, useful at beginning only (B); in pneumonia, **Veratrine** is most valuable, also in acute rheumatism and generally as an antipyretic (P). **Tartar Emetic** in frequent minute doses, gr. $\frac{1}{16}$, renders incontestable service (B); in pneumonia, tonsillitis, pleurisy, bronchitis, and other inflammatory affections (R); gr. ⅙, frequently repeated, has the power of completely dissipating early local inflammations (Spender); quite as useful in arresting local inflammations as Quinine is in malarial fever (Lawrie). **Pulsatilla**, in acute and subacute inflammations with muco-purulent discharges, especially of eyes, ears, and nasal passages (P); also with Aconite in epididymitis (Pf). **Mercury**, in acute glandular inflammation of throat and neck, in ileo-colitis, iritis, syphilitic inflammations of serous membranes, laryngitis (R). **Silver Nitrate**, locally in strong solution, gr. clx to ℥j of distilled water, painted over surface and beyond, after thorough cleansing and drying; no agent so safe, powerful or efficacious in subduing external inflammation (Higginbotham); a strong solution in Nitrous Ether is a most efficient application to check inflammation in superficial parts, as boils, felons, orchitis, synovitis, erysipelas, erythema, eczema, etc. (B). **Iodine**, as liniment in vicinity of local inflammation to produce vesication (R). **Sulphides**, especially that of Calcium, gr. $\frac{1}{10}$, appear often to arrest suppuration; after formation of pus they hasten maturation and circumscribe inflammation; in boils, abscesses, and deep-seated suppuration, they improve the condition and promote healing (R). **Antipyrin**, **Kairin**, and other antipyretics (see under the title FEVER). **Alkalies**, especially Ammonium and Potassium salts, are very valuable in the stage of exudation (B). **Astringents**, locally in inflammations of mucous membranes (R). **Lead**, the Liquor Plumbi Subacetatis Dilutus as a soothing and astringent application to inflamed and erysipelatous surfaces (Wa); to eczema and other inflammatory diseases of the skin (Pf). **Digitalis**, the German antipyretic, is especially useful in pneumonia, bronchitis, rheumatic fever, and scarlet fever (B); aconite safer and better (R); locally and internally Digitalis is useful in inflammations, especially those of the joints, of breast, erysipelatous and varicose [illegible]; a fomentation of a teasp. of the dried leaves in half a pint of boiling water, [illegible]t ʒj of tincture to the same quantity of water, applied by flannels to the par[illegible]t, will quickly subdue (Fairbank). **Quinine**, in peritonitis (Tr); is indicated [illegible]n most acute forms, unless objections occur (P); has power to arrest inflamm[illegible]ation in formative stage; with Morphine and in full doses, gr. xv–xx, may su[illegible]ppress many forms (B). **Chloral**, excellent when temperature is high, mu[illegible]ch delirium; gr. v every 3 hours (B). **Opium**, is important in most inflammatio[illegible]ns, but especially those of serous membranes; a full dose, gr. ¼ of Morphine, [illegible] at first, smaller doses after; is especially curative in inflammation of intesti[illegible]es and peritoneum, and in cerebro-spinal meningitis, arachnitis, etc. (R). **Sal[illegible]ne Purgatives**, valuable as part of the denutrition treatment, and to dimin[illegible]ish arterial tension (B). **Salicylic Acid** is antipyretic, especially in septicemic [illegible] inflammation, and in acute rheumatism, erysipelas, pneumonia (B); Sodi[illegible]um Salicylate more soluble (R). **Colchicum**, often exercises a happy influe[illegible]nce over certain acute inflammations, as bronchitis, conjunctivitis, etc., especia[illegible]lly if occurring in gouty subjects (P). **Cocaine**, locally in commencing inflamm[illegible]ations of mucous surfaces, to constrict the blood-vessels of the part (R). **Pi[illegible]locarpus**, gives good results in the exudative stage of pleuritis, iritis, keratitis, e[illegible]tc. (B). **Cold**, by Ice in bags, or cold water, a very useful agent. **Ice**, in sm[illegible]all pieces in a bladder, applied to inflamed part (R). **Water**, cold and hot ba[illegible]ths and packing very useful in all inflammations (B). **Alcohol**, is constantly p[illegible]rescribed, and is of value in low states, if symptoms after its administration [illegible]are ameliorated (B). [See under FEVER.] **Poultices**, useful in many inflamm[illegible]atory states, but often abused (B); to check formation of pus and assist in m[illegible]aturation (R). **Glycerin**, as in Unna's Paste or Antiphlogistine, a very effici[illegible]ent application in many forms of inflammation. **Heat**, by hot water, fomen[illegible]tations, etc., often much better than cold applications. **Dry Heat**, applied by the Tallerman apparatus, of great value in tendinous inflammations, traum[illegible]atic synovitis, subacute rheumatism, etc. (W). **Venesection**, when the pulse is hard, strong, full and frequent, a plethoric state of the system and gr[illegible]eat intensity of morbid action; if required, the earlier it is done the be[illegible]tter (Gross); Leeches very useful in many forms where sthenic reaction and p[illegible]lethora; value [illegible]ing probably due to derivative and counter-irrit[illegible]ant effect[illegible] [illegible]at power for good or evil, now much negle[illegible]cted (W[illegible] [illegible]es, cups, scarification, etc., should generally be [illegible]neral depletion (Gross). **Aliment**, when no[illegible]t use milk and beef-tea alternately ever[illegible]y 3 hours; no starches or fats; in intestinal inflammation milk, eggs, animal broths, oysters, fish, but all food must be used with great caution; skim-milk treatment (B); Cod-liver oil in many chronic inflammations, as of heart, lungs, kidneys, etc. (R). [Compare the various titles, as BRONCHITIS, PLEURITIS, etc., also the list of Antiphlogistics on page 37.]

[See pages 578 and 580 for Liniment and Lotion formulæ.]

℞. Tinct. Aconiti, ... ʒj.
Tinct. Belladon., ... ʒij.
M. Sig.—Three or four drops in water every hour. (B.)

℞. Ammonii Chloridi, ... ʒv.
Acidi Acetici,
Alcoholis, ... aa ʒx.
Aquæ, ... q. s. *ad* ℥x.
M. et fiat lotio. Evaporating and discutient lotion.

℞. Antim. et Pot. Tart., . . . gr. ijss.
Magnesii Sulph., ... ℥ij.
Morphinæ Sulph., ... gr. j⅓.
Ac. Sulph. Aromat., . . . ʒss.
Tinct. Verat. Virid., . . . ʒjss.
Syr. Zingiberis, ... ℥ij.
Aquæ Destill., ... ℥x.
M. Sig.—Tablesp. every 2, 4, or 6 hours. Antimonial and Saline Mixture. (*Gross.*)

Influenza.

Menthol, dissolved in Chloroform, as inhalation, to abort an attack of influenza (see under CATARRH, ACUTE NASAL), is highly efficient as a prophylactic (Wunsche); Menthol in 5 to 10 per cent. spray, is highly praised. **Cocaine**, a 4 per cent. solution snuffed up the nostrils or sprayed into them, is very efficient in the early stage (R). **Eucalyptus**, the Oil, sprinkled on blotting-paper placed around a large room, was considered an efficient prophylactic during the London epidemic of 1891, and was much used in offices, shops, etc. **Salol**, and **Salipyrin**, as internal remedies, were highly extolled during the epidemic of 1891. **Phenacetin**, is used with great benefit, both as a prophylactic and a remedy. **Phenocoll**, the Hydrochloride has been used with marked success in epidemic influenza and for the neuralgic pains thereof. **Acetanilid**, 2, with Salicylic Acid and Ammonium Bromide, each one part, forming the mixture called *Antinervin*, was used with much success during the recent epidemic in Scotland. **Quinine**, the Hydrochlorate, gr. viij daily as prophylactic, has specific action, as shown by experience with hussars at Bonn during the epidemic of 1889–90 (Graeser); the Hydrobromate in 8 to 16 grain doses, if the fever is high (Huchard); Quinine is used with benefit throughout the disease, and especially for the neuralgic pains following the acute stage (Wa). **Potassium Bicarbonate**, is more nearly specific than any other remedy; gr. xxx with ♏xx of Glycerin and Liquor Ammonii Acetatis ℥ss, every three hours; it prevents complications when given in time and also prevents sequelæ (Calvert). **Sodium Salicylate** in doses of gr. v every half hour for six or eight doses, then every hour until all pain has vanished, then every two hours for a day or two, is very efficient (Parker). **Ammonium Salicylate**, is even better than the sodium salt; add Liquor Ammoniæ Fort., ʒj to Ac. Salicylic., gr. lxxx, to make an 8 ounce mixture for tablespoonful doses (Id). **Strychnine**, for the underlying weakness and depression, the real enemy to fight against in the grippe, Strychnine is the best remedy we have (Huchard). **Digitalin**, crystallized, in dose of gr. $\frac{1}{60}$, in grippal pneumonia, in which, though the disease is in the lungs, the danger is to the heart (Id). **Sodium Benzoate**, with Quinine and Caffeine (formula on next page) in the simple form of grippe (Id). **Ammonium**, the Liquor of Ammonii Acetatis, combined with Nitric or Chloric Ether, is often of great service (Wa). **Sanguinaria**, is used with much benefit (Wa). **Cimicifuga** has been given with much success (R). **Camphor**, in solution, hypodermically (formula on next page), 2 to 4 times daily, with 3 to 6 of Caffeine and 2 or 3 of Ether, for grippal pneumonia (Huchard). **Camphoric Acid**, in one dose of gr. xx–xxx, dry on the tongue, not over 2 hours before the expected time for sweating, is remarkably efficient to prevent it. **Agaricic Acid,** gr. $\frac{1}{12}$–$\frac{1}{3}$ by mouth, is efficient against the sweating of influenza. **Bismuth Salicylate,** or Naphtol, Betol, Salol, or Benzo-naphtol, as intestinal antiseptics, when such are required (Huchard). **Sulphurous Acid,** by fumigation or inhalation, a few drops on boiling water, or as a spray, often controls influenza (R). **Benzol** vapor, is a reliable pulmonary antiseptic, and has been employed with very favorable results (Robertson). **Benzoin,** the compound tincture, ʒss–j, inhaled from a pint of hot water frequently (Da C). **Tartar Emetic** has been recommended strongly, but is too depressant (Wa); has extraordinary power of aborting local inflammations, especially those of the respiratory apparatus. [See under INFLAMMATION.] **Spiritus Ætheris Nitrosi,** in doses of ʒj–jss, in any convenient vehicle, is a popular and efficacious remedy (Wa). **Cubeb,** ʒss or ʒj doses of the tincture in ½ glass of Linseed-tea thrice daily, for the subsequent cough, often curing like a charm (R). **Opium,** best avoided in early stage, but later for the cough, with Ipecac, gives great ease; Dover's powder, with Nitre and Lobelia, is a good form (Wa). **Potassium Nitrate,** largely diluted as lemonade, ʒj–ij in the course of the day, proves highly useful (Wa). **Boric Acid,** as gargle, also borated ointment or vaselin to the nasal cavities, and great care taken to maintain a clean mouth; antisepsis of the nose, mouth and pharynx is very important and does much to prevent complications and perhaps broncho-pneumonia (Plicque). **Coca** and **Kola,** the tinctures, a mixture of equal parts of each, for the nervous depression (Id). **Hot Fomentations,** for the headache (R). **Turkish Baths,** have been used with marked advantage (Wa).

℞. Quininæ Hydrobromat.,
Sodii Benzoat.,
Caffeinæ, ... aa gr. xxx.
M. et ft. pil. no. xxx.
Sig.—One pill thrice daily. (*Huchard.*)

℞. Ammonii Chloridi, . . . ʒjss.
Morphinæ Sulph., . . . gr. ij.
Tinct. Sanguinariæ,
Syr. Ipecac., ... aa ʒiv.
Mist. Glycyrrh. Co.,
Aquæ, ... aa ℥jss.
M. Sig.—Teasp. as required for the cough. Each dose has of Morphine Sulphate gr. $\frac{1}{16}$.

℞. Ext. Cimicifugæ Fl., . . ℥ss.
Tinct. Opii Deodorati, . ʒj.
Syr. Tolutani, ... ʒxj.
M. Sig.—Teasp. every four hours.

℞. Camphoræ, ... ʒijss.
Ol. Olivæ (steriliz.), . . ℥iij.
M. Sig.—ʒss hypodermically twice or thrice daily. (*Huchard.*)

℞. Ext. Ipecac. Fl., ... ʒij.
Tinct. Opii Deodorati, . ʒiv.
Tinct. Aconiti, ... ʒj.
M. Sig.—Five to ten drops every two hours, for the bronchitis.

Insanity and Dementia.

Hyoscine, has strong power as a mental alterative; is particularly useful in that form of mental disturbance which renders the patient violent and abusive, restless and domineering, a nuisance to every one who has anything to do with him (Weatherly). **Duboisine,** gr. $\frac{1}{100}$ to $\frac{1}{75}$ hypodermically twice daily, is highly efficient in the treatment of the mental excitability of the insane, inducing quiet and refreshing sleep, and is not dangerous (Massant). **Atropine,** produced a permanent cure after bromides failed, in a case of periodic insanity with delusions of persecution (Hitzig). **Opium,** especially Morphine, is injurious in mania, but is useful in melancholia and for climacteric and senile cases. **Chloral,** does as much harm as good, is best suited to wildly maniacal and erotic patients. **Potassium Bromide,** is almost discarded, except for epileptic cases. **Conium,** is useful, sparingly, for noisy patients. **Colchicum,** for gouty cases, which are numerous; cure the gout, and you may cure the insanity. **Shower-bath,** suitable for cases due to self-abuse; the wet pack in the mania of hystero-epilepsy. **Stimulants** rank high, next to quiet and absence from hor [illegible] yroid **Extract,** has been used with apparent benefit. **Tonics** and [illegible] ould be employed in cases requiring them. **Food** of good quality is essential to the treatment. **Kumyss,** is an excellent food in hysterical dyspepsia and anorexia simulating that of insanity. **Moral Treatment,** is now successfully carried out in many asylums, but is expensive, requiring a large staff of trained attendants. With correct management from the start, nearly all cases of insanity unattended by paralysis or physical decay may be cured (Savage); this can be best administered in a well-conducted asylum or hospital for the insane, where security and the prospect of recovery will be better than in the best home; the total abolition of any one plan of treatment in favor of another would be a great mistake; more than half of first attacks of insanity are recovered from under good management, which is best attained under the direction of persons trained in this specialty (H). Recently, efforts have been made at the improvement of the condition of the insane by requiring them to attend school daily, with remarkably good results. [Compare DELIRIUM, HYPOCHONDRIASIS, MANIA, MELANCHOLIA.]

Insomnia.

Chloral, is quite unrivaled, being the most direct and generally useful hypnotic (B); acts best in cases of purely nervous type (Wa); in doses of 20 to 30 grains is by far the best hypnotic for many forms of insomnia (R); is dangerous in old drunkards, in whom the heart and vascular system have undergone fatty and calcareous degeneration (B); in combination with Opium or Morphine it acts splendidly in small dose, each ingredient intensifying the hypnotic action of the other (Brodnax); children bear it well, especially when given with Paregoric. **Chloralamid,** 30 grains in ʒj of whiskey or brandy, in simple or idiopathic insomnia, or that from nervousness, hysteria, chronic alcoholism, but not when due to excitement or severe pain. **Croton-chloral,** is feebler than Chloral and less toxic; as a hypnotic ʒj may be given (R). **Dormiol,** is a mixture of Chloral and Amylene [see page 256]. **Somnal,** is a combination of Chloral, Alcohol and Urethan, and strikingly efficient in the insomnia of convalescence from acute disease (Myers). **Paraldehyde,** in doses of ʒj–ʒij, one of the most efficient and safe hypnotics, being free from depressant action on the heart and other unpleasant by-effects. **Sulphonal,** 15 to 30 grains in milk, 2 hours before effect is desired; an admirable hypnotic in many cases, but its efficacy decreases with use, and it is of no value in insomnia due to pain. **Trional,** is markedly hypnotic and sedative, acts surely and promptly in the insomnia of neurasthenia and organic brain affections; is better than Sulphonal or Chloral in many respects (Schultze). A mixture of Sulphonal and Trional, gr. x–xv of each, is an admirable hypnotic, the latter producing early sleep and the former later sleep. **Tetronal,** is somewhat less hypnotic than Trional, but more of a sedative; the sleep from either lasts 6 to 8 hours, and is generally dreamless; neither is of any use when insomnia is due to pain. **Potassium Bromide,** when from cerebral over-action, gr. xv before each meal, and gr. xxx on retiring; has cumulative effect (B). **Opium,** 15 to 20 minims of the tincture, or 1/6 to 1/3 grain of Morphine, the most effective hypnotic when insomnia is due to pain; in combination with Chloral (see above) smaller doses of each are efficient. Opiates should be given so as to act at the natural time for sleeping (R). **Codeine** and **Narceine** are hypnotic in proper doses. **Apomorphine,** gr. $\frac{1}{30}$ hypodermically is the average hypnotic dose, should be given when the patient is ready for bed; its action lasts from one to two hours, but it often starts the patient to a good night's sleep (Douglas). **Hyoscyamus,** an effective substitute for Opium in children, ʒij–℥j of tinct. necessary, and without danger (B); when Opium disagrees (R). **Hyoscine,** produces sleep after a brief period of excitement; gr. $\frac{1}{100}$ of the hydrobromate hypodermically is excellent for the insomnia of the insane. **Duboisine,** is even more calmative and hypnotic than Hyoscine, and is especially useful when high mental excitement exists; gr. $\frac{1}{100}$ to $\frac{1}{60}$ or $\frac{1}{30}$ hypodermically, may be combined with gr. 1/8 to 1/4 of Morphine. **Belladonna** or

Atropine, is hypnotic in some conditions, especially when prostration, low arterial tension and contracted pupils. **Ignatia**, for sleeplessness from nervous erethism, better than Morphine (Pf). **Gelsemium**, in simple wakefulness (B); and in that of drunkards, mania and over-excitement (R). **Coffee**, insomnia from lowering of nervous power, and from chronic alcoholism (P). **Sumbul**, 30 to 40 minims of the tincture, with a little Chloric Ether, is very efficient in the insomnia of chronic alcoholism (P). **Tartar Emetic**, with Opium, is effective when insomnia is due to cerebral congestion and when Opium stimulates (B). **Hypnal** is credited with simultaneous hypnotic and analgesic action. **Methylal** is an efficient hypnotic. **Hypnone** is of moderate hypnotic power, but is said to be especially useful in the insomnia of acute alcoholism. **Urethan**, a pure but mild and safe hypnotic, especially useful for children. **Pellotine**, the alkaloid of *Anhalonium Lewini*, a Mexican cactus, is hypnotic in doses of gr. ¾ hypodermically (Jolly); gr. ¼ of the Hydrochlorate produced dangerous collapse in one case (Langstein). **Digitalis**, is of great use as a soporific in sleeplessness at night when drowsiness during the day, both symptoms depending on want of tone in the vessels (Br). **Resorcin**, produces quiet sleep in general nervous excitability, and in the insomnia of typhus fever and pulmonary tuberculosis. **Ether** or **Chloroform**, in full dose (R); may be used by inhalation when other means of producing sleep have proved unsuccessful. **Phosphorus**, when nutrition is inactive, and in the insomnia of the aged (B). **Humulus**, a hop-pillow is said to be effective in many cases (P); the tincture of Lupulin, ʒss–℥ss, as a cerebral sedative. **Cocaine** has bee[illegible] used with some success (Wa). **Chamomilla**, ♏j of the tinct. every quarte[illegible] hour, an excellent sedative for children (Smith). **Cannabin Tannate**, in 8-grai[illegible] doses, a good hypnotic (Fronmüller); very inefficient (W). **Cannabis** is ver[illegible] uncertain in its action (R). **Alcohol**, if from cerebral anemia, a full dose [illegible] whiskey or brandy; in some a glass of ale or beer answers better (B). **Wat**[illegible], a tepid bath just before retiring often effective; when head is hot apply co[illegible]ld to it, and a tepid bath to the body (B). [Compare NERVOUSNESS; also t[illegible]he title HYPNOTICS, on page 54, and the sub-title *Unofficial Analogues of Chlor*[illegible]*al* on page 255.]

℞.	
Paraldehydi, ...	ʒ ijss.
Alcoholis (99 per cent.), .	℥ jss.
Tinct. Vanillæ, ...	ʒ ss.
Aquæ, ...	℥ j.
Syr. Simplicis, . q. s. *ad*	℥ iv.

M. Sig.—A teasp. or two every hour until sleep is obtained.

(*Yvon's Hypnotic Elixir.*)

℞.	
Potassii Bromidi, ...	ʒ iv.
Chloralis Hydratis, ...	ʒ iij.
Tinct. Asafœtidæ, ...	ʒ iv.
Syrupi, ...	℥ vj.
Aquæ, . . . q. s. *ad*	℥ vj.

M. Sig.—Tablesp. every 2 hours u[illegible]ntil sleep is induced. In the insomnia of h[illegible]ysteria.

Intermittent Fever.

Quinine, as prophylactic, gr. v–x each morning in black coffee; begin w[illegible]ith gr. v, add gr. j each week (R); in ordinary intermittents give 6 or 10 grain do[illegible]ses up to 20 or 30 grains, so as to have it all in 4 or 5 hours before the expect[illegible]ted paroxysm; give the Sulphate and in solution to get its full action (Da C); f[illegible] for acute ague, gr. x in sweating stage, and the same dose 5 hours before ne[illegible]ext paroxysm, also gr. x–xv at the septenary periods, until the third has passe[illegible]ed; in pernicious form, gr. xx–xl are required, by stomach, rectum or skin, [illegible] to secure safety of patient; best in combination with Morphine, and with co[illegible]ontinuous administration of Arsenic during intermissions; may be given in sol[illegible]olution by rectum, or hypodermically (R); is almost specific in intermittents whe[illegible]hen uncomplicated and of recent origin (Wa); a fever fit, once begun, cannot [illegible] be cut short by quinine, and to give it during the early stages aggravates th[illegible] the headache and general distress; gr. x, preferably in solution, should be admi[illegible]inistered at the commencement of sweating, and thereafter gr. v every 6 or [illegible]r 8 h[illegible]he next 2 or 3 days (Mn). **Chinoidine** may be used as a substitu[illegible]ute for Quinine in doses twice as large (B). **Cinchonine, Cinchonidine, Quinidine,** the Sulphates of these alkaloids are scarcely, if at all, inferior to Quinine as therapeutical agents (Report of the Madras Commission). **Cinchonidine Salicylate**, promises well as an antiperiodic (B).

Arsenic, the best remedy next to Quinine, especially useful in long-standing agues of quartan type (R); useful as adjunct to Quinine daily to prevent relapse; with Iron, most important in chronic ague; also as prophylactic small doses of Fowler's solution (B). **Hydrastine**, stands next after Arsenic; indications same as for Quinine (B); in doses of gr. ij–ix is strongly recommended (P). **Tannic Acid**, enjoys a certain reputation in malarial fevers which have resisted quinine, and especially in hemoglobinuric fever (M); [see under HEMOGLOBINURIC FEVER.] **Pilocarpine**, gr. ⅛ of the Muriate, in the cold stage, is strongly recommended by high authority to excite profuse perspiration and thus lessen the attack (Da C). **Apiol**, when prejudice exists against Quinine; gtt. xv during an hour, in divided doses, 4 hours before paroxysm (B); is one of the minor remedies which often prove successful in mild cases (Wa). **Salicin**, as substitute for Quinine, but inferior (B); grs. x–xl, in mild cases (P). **Opium**, as Morphine, gr. ⅙–¼ hypodermically, not only lessens the chill, but aids the action of the antiperiodic; is to be strongly urged (Da C); is useful in the pernicious variety in combination with Quinine (B). **Capsicum**, the resins of black and red pepper, as adjuvants chiefly (B); promotes action of Quinine (Pf). **Nux Vomica**, has been used with success, but is now used as adjunct to Quinine (B); good in convalescence (P); has antiperiodic value not inferior to that of Quinine; gr. $\frac{1}{40}$ of Strychnine equals gr. j of Quinine Sulphate (Wa). **Strychnine Arsenite**, is an efficient remedy (see page 394). **Methylene Blue**, is efficient, and has many advantages over Quinine, especially for very young children (Ferreira). **Chloroform**, to prevent an impending paroxysm; ʒj–ʒij of the spirit before the chill, or by inhalation (B). **Narcotine**, gr. ij–v ter die, is eminently antiperiodic; no other drug, except Quinine, cures intermittents so rapidly and surely, or with more freedom from disagreeable effects (Wa); said to be superior to Quinine (R). **Nitric Acid**, full doses every 4–6 hours (B). **Sodium Chloride**, in large doses during the apyrexia, ʒviij–xij, may occasionally prove efficacious (Wa). **Eucalyptus**, during convalescence (B); has been successfully used in treatment of ague, ʒj–ij of a tincture (Wa). **Carbolic Acid**, in 4-grain doses with Infusion of Ginger, cured a series of 8 cases which had resisted Quinine (Wa); its value established; ♏ss–ij in mint-water or gr. ¾ in ♏xx of water, hypodermically (Tessier); combined with Iodine is of great value (B). **Mercury**, uncalled for in ordinary cases; but Hydrarg. cum Creta, Quinine and Rhubarb are of service in the obstinate intermittents of children in tropical regions (Wa). **Sodium Hyposulphite**, gr. xv–xx every two hours, is said to cure (R). **Cascarilla, Chamomile, Quassia**, are used (R). **Gentian**, is valued chiefly as a vehicle (P). **Ammonium Picrate**, has proved wonderfully effective in India, where 10,000 cases were treated therewith (Clark). **Lemon**, in decoction, exceedingly efficient in preventing recurrence of the paroxysms after they have been broken up by the use of Quinine (Crudeli). **Emetics**, may cure many cases; one each morning will assist the action of Quinine; Ipecacuanha preferred (R); only at commencement, inadmissible if gastric irritation (Wa). **Antimony**, at the onset and continuously in mild, uncomplicated cases; Tartar Emetic, gr. ⅓–⅙ every 2 hours, has been followed by complete cures (Moore). **Guaiacol**, locally to skin, as an antipyretic (see page 294). **Antipyrin**, is useless (Falkenheim). **Resorcin**, and similar agents, have no specific action, merely controlling the pyrexia (Wa). **Warburg's Tincture**, is a remedy of great power, but produces such severe diaphoresis as to be dangerous to dynamic subjects (Maclean). **Purgatives**, in the intermission, before using the antiperiodic, is good practice; Podophyllum, Colocynth or Jalap (Da C). **Iron**, is valuable in chronic cases; the system should be thoroughly saturated with it (Da C). **Ergot**, for the enlarged spleen (Da C). [Compare HEMOGLOBINURIC FEVER, MALARIA; also the List of Antiperiodics on page 37.]

℞. Acidi Carbolici, ... ʒj.
Tinct. Iodi Comp., . . . ℥iij.
M. Sig.—4 drops every 4 hours in sufficient water. (B.)

℞. Quininæ Sulphatis, ... gr. xxxij.
Mucil. Acaciæ, ... ʒij.
Syr. Eriodyctii Aromat.
(Parke, Davis & Co.), *vel*
Mist. Glycyrrhizæ Co., *vel*
Velatine, ... q. s. *ad* ℥ij.
M. Fiat emulsum. Sig.—A teasp. contains gr. ij of Quin. Sulph. Suspension of the Quinine without dissolving it makes the bitter taste less perceptible (Squire), and the syrup of Eriodictyon covers the taste well. (*Potter.*)

℞. Quininæ Sulphatis, ... gr. xl.
Ferri Sulph. Exsiccat., . . gr. xx.
Acidi Arsenosi, ... gr. j.
M. Ft. pil. no. xx. Sig.—One pill thrice daily. (B.)

℞. Quininæ Sulphatis, . . . gr. xxx.
Capsici, ... gr. xv.
Opii Pulveris, ... gr. iij.
M. Ft. pil. no. xx. Sig.—One to five pills as required. (*Piffard.*)

℞. Massæ Ferri Carb., . . . ʒj.
Acidi Arsenosi, ... gr. j.
M. Ft. pil. no. xx. Sig.—One pill thrice daily in chronic ague. (B.)

℞. Quininæ Sulphatis, . . . ℥j.
Ac. Hydrobrom. Dil., . . ℥ij.
Aquæ, ... ℥xiv.
M. Sig.—A teasp. contains gr. iij¾ of Quin. Sulph. The acid directed prevents the unpleasant cerebral action. (B.)

℞. Quininæ Sulphatis,
Pulv. Acaciæ, ... āā ℥ss.
Syr. Zingiberis,; . . . . . ℥iv.
M. Sig.—A teasp. contains one grain of Quin. Sulph. A good formula for children, the quinine being suspended, not dissolved.

℞. Quininæ Sulphatis, . . . gr. lxxx.
Ac. Sulphurici Diluti, . . q. s.
Spt. Ætheris Nitrosi, . . . ʒiv.
Syr. Tolu, Aquæ, q. s. *ad* ℥ij.
M. Sig.—A teasp. contains gr. v. of Quin. Sulph. (*Da Costa.*)

Intertrigo.

Acetanilid and Boric Acid, equal parts, dusted thickly over the surface, in the intertrigo of infants or adults, separating the surfaces which rub by absorbent cotton (Brodnax). **Bismuth**, the Nitrate or Carbonate, as dusting powder (R). **Tannin**, the glycerite, is excellent (P). **Camphor**, added to dusting powders, to allay heat and itching (R). **Lime-water**, to obviate results of irritating urine (R). **Soap**, with free ablution when intertrigo caused by acid secretions; use greasy applications afterwards (R). **Boracic Acid**, as ointment, ʒjss to ℥j of vaselin, a very useful application (Wa). **Glycerin**, with Tragacanth, etc. [See under HERPES for formula.] **Calomel**, as ointment, ʒj to ℥j, is especially useful (Wa). **Zinc Carbonate**, as Calamine, a good dusting powder; so also is the Oxide, or Fuller's Earth.

Intestinal Obstruction.

Opium, even ½-grain doses every 4 hours, for 2 to 4 days, arrests dangerous symptoms, and brings a painless purgation (Brinton, P). **Morphine**, endermically (Wa). **Belladonna**, often successfully employed (P); gr. ¼-⅓ every few hours, when from want of tone and partial spasm (Tr). **Strychnine**, occasionally beneficial; cautiously in acute cases (Wa). **Mercury**, a full dose of Calomel, followed in a few hours by Castor Oil and a Turpentine enema, affords relief (Wa). **Caffeine** acts upon the muscular tissue and often proves of the utmost value (Wa). **Senna**, the infusion, in doses of ℥j–iij, is an efficient purgative (Wa). **Purgation** to be refrained from (Brinton). **Enemata**, insufflation and surgical measures are often necessary. [Compare CONSTIPATION, HERNIA.]

Intussusception.

Belladonna, gr. iv of the extract in enema, has been successfully used (Wa). **Opium,** in full doses carried to narcotism, has been successful in many cases (Wa); must be used freely to prevent inflammation (Macleod). **Effervescent Enemata,** have been employed with success (B). **Tobacco Enema,** may overcome, and has proved exceedingly effective, but is dangerous; produces most depressing nausea; not safe to use more than ℥iv of an infusion of ʒj in Oj (B). **Inflation,** of intestines with air (Hippocrates), seems a most reasonable mechanical remedy. **Irrigation,** by hydrostatic pressure, is resorted to with success; requires care and gentleness (B); hot water (Wa); ox-gall, gr. x–xxx in the solution used, is especially efficient in cases arising from partial paresis of the bowels (Hawkins); the knee-chest position is the best during irrigation or inflation. [Compare HERNIA, TYPHLITIS.]

Iritis.

Belladonna, locally and internally (R); ♏v every 3 hours, also as lotion, ʒj of extract to ℥iv aquæ, is of great value (P). **Atropine,** solution, gr. iv to the ℥, has a wide field of utility as a mydriatic (B); should never be omitted (C); is essential in the treatment of every form, should be applied early in the case and persevered in throughout its continuance (Lawson). **Mercury,** when of syphilitic origin, as it usually is (B); the Bichloride is of great service (R); in plastic iritis of original severity, or in cases aggravated by improper treatment, Mercury is imperative, gr. ij of Blue Pill twice a day, until blue line appears on gums (C). **Aurum,** the Bromide of Gold, Arsenic and Mercury has been administered with evident advantage (E. A. Wood). **Duboisine,** as substitute for Atropine, is more rapid for effecting dilatation, less irritating to the conjunctiva, and has less permanent after-effects (B). **Turpentine,** in so-called rheumatic iritis is very successfully used; small repeated doses (P). **Opium,** when much pain, an indispensable adjuvant, or Morphine hypodermically (C). **Copaiba,** ʒij in mucilage, thrice daily, gives excellent results in iritis and sclerotitis, diminishing pain in 24 to 48 hours and restoring sight (Hall). **Quinine and Iron,** when the patient is feeble or anemic. **Irritants** or astringents should never be employed (C). **Surgical,** paracentesis when increased tension, corelysis when only one or two adjacent adhesions; iridectomy; complete functional rest to the eyes, by Atropine and a bandage with compression pad, an absolute necessity during the whole period of treatment (C). [Compare SYPHILIS.]

℞. Hydrarg. Chlor. Corr., . gr. j.
Potassii Iodidi, ... ʒj.
Tinct. Calumbæ, ... ℥ij.
Aquæ Destil., . q. s. *ad* ℥vj.
M. Sig.—A dessertspoonful, in a wineglass of water, 2 or 3 times daily.
(*Lawson.*)

℞. Ol. Terebinth., ... ʒiij.
Syr. Acaciæ, ... ℥jss.
Aquæ Cinnamomi, . . ℥ss.
M. Sig.—Teasp. 4 times daily.

℞. Extracti Belladon., . . . ʒj.
Ung. Hydrargyri, ... ℥vj.
M. Sig.—For inunction to brow.

Irritability.

Ignatia, in small doses diminishes, in large doses excites irritability of cerebro-spinal axis; the remedy *par excellence* (Pf). **Chloral,** gr. v, 2 or 3 times a day, in irritability with nervousness and restlessness (R). **Chamomilla,** is an excellent sedative for children, in doses of ♏j of the tincture every ¼ hour (Smith). **Opium,** gives calm to the nervous system if used in medium doses. **Strychnine,** in functional irritability of the nervous system. [Compare INSOMNIA, NERVOUSNESS.]

Jaundice.

Salol, is one of the most efficient remedies in catarrhal jaundice. **Mercury**, in attacks with depression, sickness and coated tongue, gr. $\frac{1}{6}$–$\frac{1}{3}$ of Gray Powder taken at onset, and repeated three or four times a day, very valuable (R); as purgative in jaundice from both deficiency and excess of bile, singularly enough (B); Gray Powder with Ipecac, followed next morning by Castor Oil, is well adapted to the jaundice of infancy and childhood (Wa); Mercurials and Podophyllum are better avoided, especially in obstructive jaundice, unless very marked indications for them exist (Da C). **Celandine**, was formerly employed as a deobstruent (P); energetically affects the liver (Pf). **Hydrastis**, useful if continued for some time, in jaundice from catarrh of ducts (B). **Arsenic**, used with success in jaundice from catarrh of bile ducts after catarrh of duodenum; better for jaundice of malarial origin (B). **Nitro-Hydrochloric Acid**, internally, and acid bath to right hypochondrium; temperature of bath 96°, ℥iij to gall. j (B); when jaundice depends on torpor of the liver, or is catarrhal in origin (W); during convalescence, ♏v–x of the dilute acid in ʒj of a compound elixir of Taraxacum before each meal (Da C). **Quinine**, when due to malaria, or when periodic (B). **Euonymin**, an hepatic stimulant of especial power (B). **Podophyllum**, in catarrhal and malarial jaundice (B); when stools exhibit no trace of bile, one dose has cured (Wa); is best avoided, unless markedly indicated (Da C). **Sodium Phosphate**, no remedy superior in jaundice from catarrh of gall ducts; ʒj doses every four hours for adults; gr. x–xx for children (B). **Manganese**, in jaundice from malarial origin or catarrh of biliary passages (B). **Aloes**, for simple jaundice of an atonic kind (B); when hypochondriasis (P). **Rhubarb**, for the above maladies in children, white or clay-colored pasty stools, skin jaundiced (B). **Saline Purgatives**, as Rochelle salt, to depurate the upper bowel; with alkaline baths, diaphoretics and diuretics (Da C). **Ammonium Iodide**, gr. j–iij in water every 2 or 3 hours in catarh of bile ducts and jaundice; also **Ammonium Chloride**, with fluid extract of Taraxacum (B); in 20-grain doses every 4 hours, produces a decided change (Wa). **Stillingia**, relieves jaundice and torpid liver following intermittent fever (B). **Dulcamara**, employed with advantage (P). **Iris**, in malarial jaundice and that from duodenal catarrh (B). **Alkaline Mineral Waters**, especially in catarrh of duodenum or bile-ducts (B). **Potassium Salts**, the Chlorate in chronic or asthenic jaundice; the Sulphate the most useful saline purgative in jaundice (Wa). **Aliment**, no starches or fats; use milk, eggs, oysters, beef broth, broiled or raw beefsteak, or whitefish (B): plenty of green vegetables at each meal; use cold water freely, avoid high seasoning in food and all liquors. [Compare CALCULI, HEPATIC CIRRHOSIS, HEPATIC DISEASES.]

Joint Affections.

Phenacetin, for the pyrexia of polyarthritis; is efficiently antipyretic and safe. **Aconite**, for pains in inflamed joints (R); the liniment locally in chronic arthritic swellings (Wa). **Mercury**, the oleate in chronic inflammation of the knee (R): Ung. Hydrarg. Ammoniat., diluted, 1 to 4 at first, then 1 to 8, by gentle friction 2 or 3 times daily, in chronic articular inflammations, by far the best application (P). **Rhus Toxicodendron**, internally and as lotion, is invaluable for subacute stiffness and aching of joints after acute rheumatic fever (P). **Iodine**, ʒiij–vj ad Glycerini ℥iij, Aq. destil. ℥iv, in numerous obstinate cases of joint affections consequent on rheumatism (Wa). **Ferrous Iodide**, with Iodine, locally, in scrofulous affections of the bones and joints (Wa). **Iodoform** has been used with satisfactory results, in scrofulous affections of the joints and bones, by many continental authorities (Wa). **Salicylic Acid**, ʒj with ʒiv of La [illegible] Ol. Olivæ, q. s. to make a paste, applied locally and covered with [illegible] in once daily for 3 or 4 days, then omitted for a week, and again renewed, is of proven value in many obstinate cases of stiff knees, pains from so-called rheumatism, painful ankle and wrist joints, etc. (Aulde). **Arsenic**, often serviceable in rheumatoid arthritis and nodosities of joints; large doses continued are necessary (R). **Alcohol**, and water, equal parts, an excellent evaporating lotion (B). **Silver Nitrate**, a strong solution in Nitrous Ether is the most efficient application to check inflammation in small joints if applied early to adjacent vascular parts (B). **Cod-liver Oil**, in strumous subjects (R); the remedy on which most reliance may be placed in scrofulous joint affections (Wa). **Cold Douche, Galvanism, Turkish Baths**, for stiff joints (R). **Digitalis**, as fomentation, ʒj of tincture to O½ boiling water, applied on flannel, has proved very efficient in acute inflammations of joints (Fairbank). **Turpentine**, the liniment a serviceable application in chronic enlargement of the joints (Wa). **Sulphuric Acid**, as irritant ointment, ʒj of acid to ℥j of lard, very beneficial in chronic diseases of joints (Wa). [Compare ARTHRITIS, BURSITIS, COXALGIA, GOUT, RHEUMATISM, SYNOVITIS.]

Keratitis.

Atropine, renders great service by contracting the vessels (B); by instillation, with enforced disuse, and a protective bandage, should be regarded as measures of course (C). **Mercuric** and **Ferric Chlorides**, with Cod-liver Oil, will accomplish all that medicine can do for interstitial keratitis in syphilitic subjects (C). **Calcium Sulphide**, proves most useful in doses of gr. $\frac{1}{10}$ to $\frac{1}{4}$, thrice daily, in sugar-of-milk trituration (Snell). **Arnica, Potassium Iodide** or **Bromide, Iron, Quinine**, for their constitutional effects in vascular keratitis; also counter-irritation by Iodine painted on the temples until soreness (C). **Ferric Chloride**, successfully employed in panniform keratitis; a large drop of the solution dropped from a quill every second or third day (Wa). **Physostigmine**, lowers intra-ocular tension (B). **Astringents** or **Irritants**, as Alcohol in any form, Zinc Sulphate, Silver Nitrate, etc., are entirely inadmissible (C). **Iridectomy**, is often beneficial in severe vascular keratitis (C). **Pressure-Bandage**, in severe suppurative forms, limits extent. **Water**, cold when inflammatory symptoms marked; hot, 90°–100° F., in non-inflammatory form, to excite inflammatory reaction; should be discontinued when marked injection occurs. [Compare CORNEAL OPACITIES.]

℞. Hydrarg. Chlor. Corros., . gr. j.
Ammonii Chloridi, . . . gr. vj.
Tinct. Belladonnæ, . . . ʒij.
Aquæ Destillatæ, ... ℥viij.
M. et fiat collyrium.

Sig.—A teasp. in a winegl. of tepid water, to be applied frequently with a pledget of lint on the closed lids. In phlyctenular keratitis of children.
(*Turnbull.*)

Labor.

Ergot, only when uterine inertia, and after the first stage has passed; is dangerous if any obstacle in front; dangerous to child by paralysis of fetal heart (B); is best given when the head has passed the brim of pelvis (Wa). **Anesthetics**, in protracted and painful labor; cautiously with primiparæ (B); increase the risk of post-partum hemorrhage (W). **Chloroform**, not to complete anesthesia, lest uterine action be interrupted; usually begin its inhalation when os is dilated (Simpson). **Chloral**, of great value to relieve pain; does not interfere with the exhibition of chloroform; should be given in 15-grain doses every ¼-hour till effect produced (Wa); the best of all remedies for rigid, undilatable cervix, gr. xv every 20 minutes for 3 doses, perhaps a 4th after an hour's interval (Playfair). **Ethyl Bromide**, a rapid, sure and safe anesthetic, particularly suited to labor cases (Levis). **Opium**, facilitates dilatation, promotes expulsive power of uterus, lessens hemorrhage, stimulates longitudinal and oblique fibres of the os (Wa); a full dose of Morphine, gr. ¼, in tedious labors, with severe pains, will aid patient greatly and promote progress of the child; no bad results ensue; for relief of pains and after-pains, or painful complications (Wa); hypodermically in rigid os and cervix (R). **Cimicifuga**, exercises special action, similar to that of Ergot; is less dangerous to life of child and soft parts of mother (Wa); for mental disturbance and suppressed lochia (R); as *partûs accelerator* in lieu of Ergot, also to allay nervous excitement after labor, and to check post-partum hemorrhage (P). **Belladonna**, topically to uterus of great service in long-protracted labors from rigidity of os and cervix (H). **Gelsemium**, quiets the nagging pains of the first stage; requires physiological doses (B); relaxes spasm in rigidity of the os (Wa). **Acetanilid**, eases pain and brings on profuse sweat which helps to relax muscular rigidity (Brodnax). **Quinine**, to strengthen uterine contractions; used by many in place of Ergot (R). **Cannabis Indica**, the tincture gtt. xxx, as stimulant to uterine contractions, more prompt, less lasting, than Ergot (Wa). **Ipecacuanha**, after delivery; to promote natural functions (R). **Cotton-root**, as excitant of uterine contractions, may be more energetic than Ergot (P). **Althæa**, the decoction, as vaginal injection in difficult labor (P). **Sodium Borate**, excites activity of the uterus, and is well employed in tedious labor, where there is deficiency of uterine action (Rigby). **Amyl Nitrite**, has acted admirably in a case of hourglass contraction of the uterus; seems to antagonize the action of Ergot (Barnes). **Oil of Eucalyptus** is very valuable in effecting antiseptic midwifery (Wa). **Mercury**, the Bichloride, gr. vijss to a quart of hot water gives a $\frac{1}{2000}$ solution; probably the worst of all antiseptics for this purpose; is too dangerous for obstetrical use (Fleischman). [Compare ABORTION, AFTER-PAINS, FALSE PAINS, HEMORRHAGE POST-PARTUM, LACTATION, PUERPERAL CONVULSIONS,—MANIA,—FEVER,—DISORDERS.]

Lactation.

Pilocarpine, as a galactagogue, gr. ⅛ in brandy on retiring, the patient to be covered well in bed; is efficient in direct proportion to its diaphoretic and sialogogue effects, these being evanescent, but its galactagogue power remains for weeks, an occasional dose only being required to spur up the secretion when flagging (Minges): is a galactagogue, and probably the only example of this class we possess (M). **Antipyrin**, is an anti-galactagogue, 4-grain doses every 2 hours have proven highly efficient. **Belladonna**, internally or externally or both, in excessive lactation (R); Atropine gr. iv to ℥j Aquæ Rosæ on lint around the breast to arrest secretion of milk; remove when fauces become dry and pupils dilated (B). **Camphor**, locally to arrest the secretion; a saturated solution in Olive Oil or Glycerin, is more efficient than Belladonna (Wa). **Potassium Iodide**, in 25 to 30 grain doses internally, for the same purpose, is very effectual (Rousset). **Calcium Phosphate and Hypophosphite**, in debility from over-lactation (R, Wa). **Ammonium Chloride**, for the intercostal neuralgia of nursing women; gr. x–xx, every 3 or 4 hours (Wa). **Quinine, Tannin**, are used to arrest the secretion (R). **Alcohol**, as beer or porter, often useful for women weakened by suckling—not always (R). [Compare ABSCESS, AGALACTIA, MASTITIS, NIPPLES, also the List of Galactagogues on page 52.]

Excreted in the Milk, when taken by the nursing women are: the Oils of Anise, Cumin, Dill, Wormwood and Garlic, Turpentine, Copaiba, the active principles of Rhubarb, Senna, Scammony and Castor-oil, Opium, Iodine, Indigo, Antimony, Arsenic, Bismuth, Iron, Lead, Mercury and Zinc. Acids given to the mother cause griping in the child. Natural salts, as a rule, and the purgative agents above-named, act as purgatives to the child, and Potassium [illegible] diuretics. Turpentine, Copaiba and Potassium Iodide given to [illegible] be detected in the urine of the child. Opium given to the [illegible] cotize the child, and Mercurials in the same manner may salivate it (Br). Atropine, Hyoscyamine, the Salicylates and Potassium Sulphide, have been found in the milk after their ingestion by the woman.

℞.	Tinct. Aconiti, ...	♏xx.
	Antim. et Potass. Tart., .	gr. ij.
	Spt. Ætheris Nitrosi,	
	Syr. Simplicis, ...	aa ℥j.
	Aquæ Aurantii Flor., . .	℥ij.

Misce. Sig.—A teaspoonful in a wineglassful of sweetened water, every two hours, for milk fever. (*Fordyce Barker.*)

Laryngismus Stridulus.

Aconite, checks the spasm and relieves the croupous breathing (R). **Antipyrin**, has proven very serviceable. **Belladonna**, promises to be of value (Wa); Atropine, gr. $\frac{1}{100}$ in a goblet of water (60 doses), of which a teasp. every hour or ½-hour will give prompt relief (Smith). **Bromides**, when uncomplicated except with convulsions (R); full doses will suspend an attack, and moderate doses steadily continued will prevent recurrence (B). **Ipecacuanha**, an emetic dose to cut short an attack (B). **Lobelia**, has been employed (R). **Chloroform**, quickly cures the paroxysm, a few drops on a handkerchief sufficient (B); may often be used with advantage (W). **Nitroglycerin**, will speedily allay the spasm (B). **Chloral**, gr. v–xv to prevent or arrest (B). **Quinine**, given between attacks to prevent (B); a most valuable remedy, in small, repeated doses (P). **Emetics**, Tartar Emetic; Mercuric Sulphate, gr. iij–v, safer and better (R). **Conium**, is valuable, carried to a point of physiological effect (B). **Water**, wet pack to neck (B); cold sponging twice or thrice daily more successful than anything else, with out-of-door exercise; cautiously if hoarse voice indicates laryngitis (R). [Compare CROUP, LARYNGITIS.]

Laryngitis, Acute Catarrhal.

Aconite, very valuable (R); especially indicated in inflammatory states of respiratory parts; gtt. ss–j every half-hour till an impression is made on the fever, then every hour or two (B). **Antimony**, Tartar Emetic, gr. $\frac{1}{50}$, a very excellent remedy internally; larger doses in edematous laryngitis, gr. $\frac{1}{12}$ with gr. iij of Dover's powder every 2 or 3 hours (Da C). **Iodine**, inhaled, also as counter-irritant painted over neck (B). **Morphine**, small doses to allay cough (A). **Sulphurous Acid** as spray is vaunted (Wa). **Leeches** to throat are valuable auxiliaries to general treatment in sthenic cases; or cupping at the nape of the neck (Wa). **Rumex**, has selective action on the laryngeal mucous membrane (see page 459). **Zinc** or **Copper Sulphates**, as emetics, in large quantities of warm water, where edema slight (A); a solution of Zinc Sulphate, gr. xx to the ℥ on sponge to larynx with aid of the laryngoscope if possible to use it (Da C). **Scarification**, by Mackenzie's laryngeal lancet, of great service in the edematous form (Da C). **A Purgative** and **Diaphoretic**, with mucilaginous drinks, if given at the start may be sufficient (Da C). **Iron**, Monsel's solution, 1 part to 2 or 3 of water and glycerin, an excellent local application (Da C). **Heat**, by poultices or fomentations (A); hot-water stupes may succeed (Wa). **Inhalations** of hot steam, with Benzoin, the comp. tinct. gtt. x–xv to the ℥, with gtt. x Tinct. Opii, or Hops, or Conium, of great service (Da C). **Tracheotomy** ought not to be delayed, if inhalations, leeches, and fomentations fail (Wa); is especially indicated in sudden attacks of edematous laryngitis, as those occurring in Bright's disease (Da C). **Ice**, steadily applied in bags over the larynx, if tracheotomy refused, has succeeded in bad cases; small pieces may be slowly swallowed (Da C). [For Croupous Laryngitis, see CROUP MEMBRANOUS; for Spasmodic Laryngitis, see CROUP CATARRHAL; for Edematous Laryngitis, see GLOTTIS EDEMA OF. Compare also LARYNGISMUS STRIDULUS, PHARYNGITIS.]

Laryngitis, Chronic.

Iodine, painted over neck as a counter-irritant, and inhalation of its vapor (B). **Sulphur**, as Sulphurous Acid by spray in syphilitic laryngitis, or a solution of Sodium Sulphite, ʒj to the ℥ of water (B); by inhalation, spray, or fumigation (R). **Carbolic Acid**, where long-standing hyperemia with diminished secretion, ʒj–ij to the ℥ of glycerin is a most successful application (Mackenzie). **Silver Nitrate**, powdered or in solution to chronically inflamed larynx (R); a solution of gr. x or xx to the ℥, applied with a brush by the aid of the laryngoscopic mirror (W); formerly much used, but is objectionable (B); should be used with great caution, and only when a particular point can be seen for it with the laryngoscope (Da C). **Ferric Chloride**, a solution of ʒj–ij in the ℥ of glycerin, as a local application (A). **Zinc Chloride**, gr. xx–xxx to the ℥ of glycerin; alternation of topical remedies is of great value (A). **Copper Sulphate**, gr. xx to the ℥ of water, locally twice a week (Da C). **Bismuth Subnitrate**, by insufflation, is highly recommended in the worst forms of laryngitis (Tr). **Guaiacum**, as lozenges, is useful in mucous laryngitis (A). **Althæa**, as pectoral lozenzes to relieve laryngeal irritation (P). **Cubeb**, the berries chewed are very efficient in relaxation of the larynx following a cold or prolonged speaking (Wa). **Cocaine**, a 20 per cent. solution by spray, mop, or brush, is efficient in many laryngeal affections (James). **Benzoin**, in strumous laryngitis (Wa); in chronic, Benzoin on hot coals, or inhaled from boiling water, is of great service (Tr). **Tannin**, in chronic catarrh and ulcerations, a solution, gr. x–xx to ℥iv, applied by hand-ball or steam atomizer (A). **Inhalations**, or spray, of the best agents, very grateful (B); air loaded with vapors of Ammonium Muriate by inhaler, said to be used successfully (W); vapors from boiling Tar, Turpentine, etc., placed on hot water, or better by steam atomizer (Da C); Chloroform, Hops, Benzoin, etc., by atomization (Walker). **Insufflation**, substances to be in small quantity, mixed with some bland powder (B). **Functional Rest** of the voice often requisite, especially in phthisical and syphilitic laryngeal ulceration (A). **Chronic Laryngitis**, includes many disorders of the larynx, which of late years have been differentiated as thickened vocal cords (chronic laryngitis proper), laryngeal ulcers, polypi, cysts, cauliflower growths, tubercular and syphilitic laryngitis, etc., in all the voice being similarly affected. **Dysphagia**, as a concomitant symptom is indicative of tubercular laryngitis (Da C). [Compare COUGH, DYSPHAGIA, SYPHILIS.]

Laryngitis, Tubercular.

Cocaine, as pastilles or by insufflation, to relieve pain and dysphagia, especially when much ulceration or perichondritis present; in the later stages its use prolongs life. **Resorcin**, a strong solution locally, is very beneficial in tuberculous and other ulcerations of the larynx (Tymowski). **Zinc Sulphate**, in solution mixed with a 1 or 2 per cent. solution of Cocaine, in the early catarrhal stage (Neumann). **Silver Nitrate**, in powder or solution locally (R). **Bismuth Subnitrate**, by insufflation is highly efficient (Tr). **Iodoform**, in large insufflations has surprising anodyne effect when extensive tubercular ulceration exists (Neumann). **Iodol**, and Boric Acid, equal parts, by insufflation, in less severe cases (Id). **Antitoxin**, Paquin's serum has produced good results (Loeb). **Menthol**, is of great value, relieves pain and is claimed to destroy the local deposits; a solution of 1 in 10 of pure olive oil brushed freely over the part daily, a solution of 1 in 5 being used after the first week. **Lactic Acid**, is reported by many authorities as highly successful, even curative; a solution of 30 per cent., gradually increased to 75 per cent., brushed over the affected surface after abbing with Cocaine, or a few drops injected into the larynx by a laryngeal inge; is excellent, lasting good results having been obtained thereby hitla). **Scraping** the ulcerated spots before applying lactic acid, done by me in 200 cases with 28 cures (Ehring). **Tracheotomy**, where deep and extensive ulcerations exist beyond the reach of local treatment. **Diet**, thick liquids are more easily swallowed than thin ones, and if the patient lies on a couch or bed with his head hanging down over the side while swallowing, this is rendered easier (Wolfenden); feeding should be done by the soft rubber tube when much dysphagia exists which does not yield to cocaine. **Dysphagia**, as a constant symptom of chronic laryngitis is indicative of the tubercular form (Da C).

Laryngotomy.

Laryngotomy is more quickly and easily performed on the adult than tracheotomy, being further from the lungs and less dangerous. It is usually directed to be performed by cutting longitudinally through the skin, then horizontally through the crico-thyroid membrane, which may be felt as a soft depression, an inch below the pomum Adami. In urgent cases, however, Professor Wood recommends a narrow-bladed knife to be passed horizontally through both skin and membrane at once, and then to enlarge the opening laterally to the required extent. The advantage of having a horizontal incision in the skin is the greater openness of the wound when the patient throws up his head under a sense of dyspnea (D). In **Laryngo-Tracheotomy**, the deep incision is carried downwards from the crico-thyroid membrane, through the cricoid cartilage and one or two upper rings of the trachea (Cl).

Leprosy.

Anacardium Orientale, Oil of Cashew, has been much lauded; investigation established that much of its success was due to hygienic measures and use of fresh meat as food (P). **Arsenic**, with 5 or 6 times the quantity of black pepper, in esteem in India (Wa). **Sarsaparilla**, as tonic and alterative is valuable (P). **Gurjun Balsam**, Wood Oil, as ointment and emulsion, has been used with success in alleviating the disease, by Dr. Dougall, Port Blair, Andaman Islands; the ulcers of 24 lepers healed thereby. **Ferri Arsenas**, gr. ⅛ daily, is used with success (Wa). **Mercury**, the Oint. of the Red Iodide, diluted 1 to 10, or gr. j of the salt to ʒv of unguentum, gives very good results (Wa). **Europhen**, 5 per cent. in oil, cured a case some years ago on the Island of Madeira (Goldschmidt). **Chaulmoogra Oil** [see page 252], is credited with a few cures and many cases improved; the oil is mixed with Psoralea corylifolia as a liniment, and is also used internally (Wa). **Hoang Nan**, is considered of utility by a number of writers on leprosy, and is given in combination with Alum 1, Realgar 2 or 1, and the drug 2 parts, the whole being made into 3-grain pills, one pill daily being given at first and gradually increased (Pf). **Argenti Nitras**, is said to act as a tonic and alterative, and to control leprosy for a limited period (Pf). **Ichthyol**, used internally in increasing doses, with vigorous rubbing of the arms and legs twice daily with a 10 per cent. ointment of Pyrogallic Acid in Lanolin, and the cheeks and trunk with Chrysarobin, 10 per cent. in Lanolin, also applying to the forehead and chin a plaster of Chrysarobin, Salicylic Acid and Creosote, changed every day. This treatment, continued for a month, and followed by a course of warm baths before being resumed, has cured several cases (Unna). **Sodium Salicylate**, in doses of gr. xv four times a day, gradually increased for six months or a year, if commenced early in the disease, sometimes effects a cure (Danielssen). **Thyroidin**, caused marvelous improvement in a case of nerve leprosy during 3 years of its use (Mn). **Goto Treatment**, consists in bathing daily in hot water in which are placed bags containing hichiyon bark, taifunshi, sulphur and yoku yaku; internally are given seiketsuren pills, tincture of the chloride of iron, quinine, strychnine, potassium iodide, gentian, columbo, carbonate of soda and potash, and Epsom salts (Alvarez); but proof is lacking that cure has been obtained in any case (Emerson). **Toxins** and **Antitoxins**, are being tried in various parts of the world, but are not trustworthy, as the bacillus has never been cultivated and animals are quite refractory thereto (Goldschmidt). **Diet**, nutritious food, with frequent baths and great cleanliness, will do much to prevent the manifestations of the disease (R).

Leucocythemia—Leukemia.

Arsenic, in as full doses as can be borne, may be of service, though hitherto ineffectual (Gowers); produced rapid improvement in a severe case, conjoined with Oxygen inhalations, 5 minims of Liquor Arsenicalis being given thrice daily, increased by 2 minims every 4 or 5 days until the dose reached 45 minims (Fred'k Taylor); is of the greatest value and great improvement has resulted from its use in many cases (Muir). **Oxygen**, 30 litres by inhalation daily with the conjoined use of Arsenic, has been successful in the early stages in some cases, but in many it has failed (Muir); 4 litres daily for 2 months cured one case, the spleen being of normal size after the treatment (Koster).

Alkaline Hypophosphites, have been used with more or less benefit (Wa). **Digitalis**, in young subjects (B). **Nitro-muriatic Baths**, should not be neglected, with tonics and nutrients (A). **Iron**, is of little value (B); large doses may do good in the early stage, with careful diet, and **Ergot** to contract the spleen (Da C). **Phosphorus**, gr. $\frac{1}{60}$ increased to gr. $\frac{1}{30}$, has proved successful in several cases (Wa): good results have been reported in one or two cases, but the general experience is that it is of no value (Muir). **Quinine**, in large doses, is considered of value by some, but it is distinctly inferior to Arsenic (Id). **Thymus Extract**, has been used with benefit. **Bone-marrow** is worth a fair trial. **Galvanization** of the spleen, is curative in uncomplicated cases (B); causes improvement of the blood, increasing the number of its red corpuscles (Gowers). **Splenectomy** has been performed in a number of cases, almost invariably with fatal result; is absolutely unjustifiable and is also useless (Muir). [Compare ANEMIA, LYMPHADENOMA.]

Leucorrhea.

Hydrastis, the fluid extract undiluted, applied topically, quickly improves in uterine and vaginal leucorrhea (B). **Pulsatilla**, 5-drop doses ter die for a few weeks; also a teasp. of the tinct. in a pint of cold or tepid water, as vaginal enema daily, when pain in the loins, depression of spirits, loss of appetite, etc. (P). **Silver Nitrate**, in solution locally, also tampon saturated with ʒj each of Alum and Bismuth, when leucorrhea due to granular vaginitis (Parvin). **Balsams of Peru and Tolu**, internally (P). **Glycerin**, is largely employed for vaginal leucorrhea, and for erosions and ulcerations of the cervix uteri (B); the best vehicle for other agents (E). **Glycozone**, applied on small rolls of lint or absorbent cotton, after thorough washing of the vagina with solution of Hydrogen Dioxide, 1 to 4 of water, and repeated twice daily (Edson). **Borax**, ʒj to Oj of water, as vaginal wash for the leucorrhea of pregnancy (Parvin). **Cimicifuga**, is said to be useful (P). **Copaiba**, has been used with success (P). **Cocculus Indicus** when sero-purulent discharge, pain in lumbar region (P). **Carbolic Acid**, diluted, as injection (B); for vaginal leucorrhea (R). **Bismuth** with mucilage, as injection; or with cacao-butter as suppository (B). **Copper Sulphate**, in solution, as injection (R). **Tannic Acid**, in chronic cases serviceable as injection, ʒss in ℥viij of claret wine (B); if os ulcerated, a suppository of tannin and cacao-butter to mouth of uterus (R). **Iodo-Tannin**, is an excellent application, ʒj of iodine to ℥j of tannic acid, a sufficient quantity to be packed dry around the cervix (B). **Alum and Borax**, make a useful injection in v[illegible] (R). **Belladonna**, with Tannin as bolus when neuralgia [illegible] when disease due to over-secretion of mucous glands about the os and much pain present inject Sodii Bicarbonat., ʒj; Tincturæ Belladonnæ, ℥ij; Aquæ, Oj (R). **Potassium or Sodium Bicarbonate,** ʒj in Oj aquæ as injection, especially when discharge alkaline and copious (R). **Pareira, Uva Ursi,** are successfully used (P). **Sumbul,** recommended in atonic form (P). **Myrrh,** with Iron or Aloes, beneficial (P). **Ergot,** said to be useful in some cases (R). **Potassium Permanganate,** has no special advantage; is used in solution, gr. ij to the ℥ (B). **Potassium Chlorate,** ʒj to Oj of water as injection in simple cases (Parvin). **Iron,** the Iodide, internally and externally has proven serviceable; the Mistura Ferri Composita, when anemia and general debility (Wa); the styptic preparations locally (R). **Phosphates,** for the cachexia (B); Calcium Phosphate, gr. j–ij several times daily, of great value in checking profuse discharge (Wa). **Injections,** water at 60° F. to prevent recurrence (R); hot water injections are the best tonic for the pelvic vessels to relieve venous congestion; use with elevated hips (E). [Compare ENDOMETRITIS, UTERINE ULCERATION, VAGINITIS.]

℞. Aluminis, ... ʒj.
Zinci Sulph., ... ʒss.
Sodii Boratis, ... gr. iv.
Aq. Rosæ, ... ℥viij.
M. Sig.—Injection. (B.)

℞. Liq. Plumbi Subacet., . . ℥jss.
Ac. Carbolici, ... ℥ss.
M. Sig.—One-fourth to be added to a pint of water and used as an injection.

Lichen Planus.

Arsenic, is the only remedy which exercises anything like a specific effect, and it not infrequently fails (Brooke). **Antipyrin,** internally for the itching, is efficient. **Aconite,** sometimes useful (R). **Mercury,** Calomel and Mercuric Nitrate Oint. mixed, also Tar Oint. may be added, in patches of obstinate lichen (R). **Silver Nitrate,** the Nitrous Ether solution painted over the patch every day or two (R). **Quinine,** with Belladonna and Ergot, as in urticaria (Brocq); large doses in an effervescing mixture (Crocker). **Potassium Chlorate,** gr. xv before meals, also dilute Nitric Acid, ♏x after meals, thrice daily, has given very good results (Bulkley). **Lead-water** as lotion, thickened with zinc and starch powder or calamine, with the addition of a few drops of Carbolic Acid or Liquor Picis Carbonis, has a very sedative effect in very acute cases (Brooke). **Mercury,** as in Unna's ointment, composed of Hydrarg. Chlor. Corr. gr. iij–v–xx, Ac. Carbol. gr. xx, Ung. Zinci ℥j; the smallest quantity of the mercurial for extensive cases, the larger for local caustic effects in stubborn patches. If used early and efficiently this ointment alone will remove the threatening general symptoms of lichen neuroticus (Unna). **Excision** may be required to remove the horny accumulations of lichen corneus (Brooke). **Cautery** for the same purpose, even superficially applied it sometimes removes the itching permanently (Van Dort). Formerly used to denote many spreading papular eruptions, the term *Lichen* is now restricted to one specific form of disease, that described by Erasmus Wilson as *Lichen Planus,* of which Hebra's *Lichen Ruber* is a rare and aberrant acute manifestation (Brooke). [Compare ECZEMA, STROPHULUS.]

Lithemia.

Piperazin, by far the best agent to promote the elimination of uric acid and urates, with which it forms one of the most soluble of uric acid compounds: relieves the pruritus of the uric diathesis. **Lithium Salts,** especially the Citrate, gr. xx thrice daily, is very efficient (Da C); the Carbonate invaluable (Wa); the Bromide, in solution of Potassium Citrate given after stomach digestion is completed, one of the very best agents (Aulde). **Strontium Salicylate,** in chronic gouty conditions and in lithemia with intestinal indigestion, the most valuable drug that we have (W). **Salicylic Acid,** or its salts, are most powerful solvents and excretents of uric acid (Haig). **Lysidin,** is still more solvent of uric acid than is Piperazin [see page 430]. **Cascara Sagrada,** is believed to promote the excretion of uric acid. **Colchicum,** 15 minim doses of the wine twice or thrice daily, are very useful (Wa); the combination of Colchicine with Oil of Wintergreen in capsules [see page 284] is a useful remedy. **Coffee,** a tincture of green coffee is anti-lithic. **Pichi,** of great value in lithemia with cystitis (Wyman). **Arsenic,** in small doses, is also useful (Da C). **Nitric Acid,** 10 mimim doses of the dilute acid in half-glass of water thrice daily, with an occasional dose of Pil. Rhei Compos. at bedtime, is the most efficient treatment for patients who will not diet themselves (Hughes). **Purgatives,** especially alkaline mineral waters, to clear the portal system (Da C). **Sodium Phosphate,** in laxative doses, ʒj thrice daily, gives good results. **Alkalies,** in biliousness; also the continued use of alkaline waters rich in potassium salts, for solution of calculi (B). **Acids,** Hydrochloric often of great service; also Lactic, when faulty digestion and assimilation (Br). **Potassium Permanganate,** prevents calculi by converting uric acid into urea (B). **Buchu,** combined with an alkali, has been beneficial (P). **Chimaphila** is believed to check the secretion of uric acid (P). **Aliment,** farinaceous vegetables and acid fruits are suitable (B); Alcohol in any form is poison to a lithemic (Da C); succulent vegetables and fruits, occasional abstinence from animal food; milk diet, and frequent draughts of pure water are recommended; removal to a locality where pure soft water can be procured, is often curative; high living, alcoholic liquors, and sedentary habits are injurious. [Compare CALCULI, DYSPEPSIA, GOUT.]

℞. Lithii Bromidi, ... ʒss–j.
Liq. Potassii Citrat., . . ℥iv.
Syrupi Simplicis, ... ℥ij.
M. Sig.—A teasp. in a wineglassful or more of water, 2 hours after each meal. Reduce the dose after a week.

℞. Potassii Nitratis, ... ʒj.
Ext. Pichi Fl., ... ʒj.
Elixir Simpl., ... ℥iij.
M. Sig.—A teasp. every 2 hours.

℞. Tinct. Belladonnæ, . . . ♏xviij.
Vini Colchici Rad., . ʒij.
Liq. Potass. Citrat., q. s. *ad* ℥iv.
M. Sig.—A dessertsp. well diluted, every 3 hours.

℞. Vini Colchici Rad., . . . ʒij.
Ext. Phytolaccæ Fl., . . ʒj.
Potassii Acetatis, ... ʒiij.
Aquæ, ... q. s. *ad* ℥vj.
M. Sig.—A tablesp. four times daily.

Locomotor Ataxia.

Antipyrin or **Phenacetin** for the lancinating pains; the former relieves them remarkably; the use of Morphine for the pains should be avoided as long as possible (Osler). **Acetanilid,** is admirable for relief of the pains (B). **Belladonna** and **Ergot** are highly efficient (Brown-Séquard). **Silver Nitrate,** when motor disturbances are very marked; improved 1 case in 20 (R); gives the best results in doses of gr. $\frac{1}{4}$ to gr. $\frac{1}{2}$ thrice daily, withholding it after a few weeks to prevent argyria (Da C); the only remedy which has done good in progressive locomotor ataxia; gr. $\frac{1}{10}$–$\frac{1}{2}$ two or three times daily, with Sodium Hypophosphite, both to be discontinued when blue line appears on gums (Althaus). **Silver Oxide,** may be used instead of the nitrate, in half-grain doses (Da C). **Aurum,** is especially curative in all forms of sclerosis; the Bromide of Gold and Arsenic has been of special service in this form (E. A. Wood). **Potassium Iodide,** Corrosive Sublimate, or Gold and Sodium Chloride, all in full doses, often retard the progress of the disease (Da C). **Physostigma** has proved beneficial (R). **Phosphorus,** useful, but may not cure (B). **Hyoscyamine,** ameliorative, gr. $\frac{1}{32}$ gradually increased to gr. $\frac{1}{16}$ (B). **Electricity,** the galvanic current relieves pain; faradic stops wasting of muscles (B); in the stage of irritation the constant current (ascending) through spinal column (R). **Water,** one of the most efficient agents; friction with a cloth dipped in wat[illegible]–65° F., a cold compress to head; 4–8 minute bath of 70–75° [illegible]red to 60°, then shower-bath and frictions (R). **Rest,** as com[illegible]le, must be insisted on; with good, nutritious diet, milk being desirable (Da C). **Pilocarpine**, produces general improvement if given in the incipiency, gr. j to ℥j of water, of which ♏xxx thrice daily (B). **Strychnine**, gr. $\frac{1}{60}$ in ʒj of Syr. Hypophosphitum, thrice daily, when the system is saturated with silver (Da C). **Suspension** daily, by head, has seemed to give relief to pain and improve condition: is known as Charcot's treatment, but originated with Matchoukowsky of Odessa, and was carried out systematically by Hessing of Pesth, before Charcot took it up: is now abandoned. **Morphine**, sooner or later becomes necessary for the lancinating pains; in one case, personally known to the author, which had been treated ineffectually by every known method, including suspension by Charcot himself, and was rapidly progressive, the abandonment of the hypodermic syringe for Morphine by mouth, gr. xv daily in divided doses, has seemed to result in complete cessation of progress, which has now lasted over six years; the patient is free from pain, eats and sleeps well, and attends to business, getting around by aid of a stick and some slight assistance from friends when crossing a crowded street. **Orchitic Extract**, also **Spermine**, have been used with some success. **Cerebrinin**, is reported beneficial [see page 164].

Lumbago.

Cimicifuga, is said to be more effectual than any other remedy (R); has sometimes wonderful success; no indications can be given for it; ʒss–ij of fluid extract (B); is curative (P). **Rhus Toxicodendron**, in subacute muscular or tendinous rheumatism, worse at night; completely relieves some cases (Pf). **Veratrum Viride**, the tincture useful (R). **Aconite**, in ¼ ♏ doses of tincture every two hours, with Linim. Aconiti locally (Wa). **Iodides**, if referable to syphilis, mercury, copper, tin, or lead poisoning (B). **Ammonium Muriate**, is very efficient in myalgic lumbago, gr. xx thrice daily for 2 days or until signs of congestion of the nasal mucous membrane appear, then to be replaced by Quinine, gr. v, thrice daily for a week (Waugh). **Antipyrin**, gr. vij, hypodermically, completely banished it in a very bad case at the Hôtel Dieu, Paris. **Morphine**, hypodermically, to relieve pain (R); gr. ⅙ with Atropine gr. $\frac{1}{80}$, hypodermically, will frequently cure lumbago in two or three hours (Da C). **Capsicum**, a strong infusion applied on lint, and covered with oiled silk, very efficient in recent lumbago (R); a Capsicum plaster is a very efficient application. **Potassium Nitrate**, in ten-grain doses hourly or every two hours, when urine scanty and high-colored (R). **Belladonna**, as plaster, very valuable for persistent lumbago remaining in a small spot (R). **Turpentine**, in doses of ♏xx–xxx, carefully lest strangury and nephritis, of greatest value when the bowels are regular and urine clear and abundant (Wa). **Ether Spray**, externally as freezing mixture (R). **Guarana**, in 20 to 40 grain doses, removed severe chronic lumbago (Rawson). **Chloroform Liniment**, affords relief (Wa). **Canada Balsam**, gr. v–xx, is useful, or **Burgundy Pitch**, as plaster (P). **Acupuncture**, occasionally gives instant relief (B); not when high fever (R). **Aquapuncture**, has been employed with extraordinary success (B). **Heat**, by hot douche to seat of pain (B); or by very hot poultices for three hours, then the skin covered with flannel and oiled silk; or a hot flat-iron (R). **Galvanism**, the constant current (B); is highly useful; faradization almost as successful as acupuncture (R). **Strapping** from the thigh upwards with layers of adhesive plaster which overlap each other; nothing is so instantaneously beneficial. **Diet**, should be generous and nutritive; Lemon-juice as a beverage. Absolute rest is of great importance. [Compare LITHEMIA, MYALGIA, RHEUMATISM.]

℞. Collodii,
Tinct. Iodi.,
Spt. Ammoniæ, . . āā part. æq.
Sig.—Paint over the part with a camel's-hair brush. (*Burggraeve.*)

℞. Ammonii Chloridi, . . . ʒj.
Ext. Cimicifugæ Fl.,
Syr. Simplicis, ... āā ℥j.
Aq. Laurocerasi, q. s. *ad* ℥vj.
M. Sig.—A dessertsp. every four hours.

Lung Diseases.

Aconite, is indicated in most acute congestions (P); is especially indicated for inflammatory states of the respiratory organs (R); **Belladonna,** in doses of ♏j of the tincture frequently, is of great benefit in pulmonary edema, to retard exudation of serum and to counteract the failure of the heart (Smith). **Terebene,** is very valuable in many conditions. **Terpin Hydrate,** is still more efficient and more easily administered. [See under BRONCHITIS.] **Ammonium Acetate,** serviceable not only in bronchitis, but in the whole range of acute pulmonary complaints occurring in children (Dessau). [See under BRONCHITIS, for formula.] **Veratrum Viride** renders important service in acute parenchymatous congestions (B); gr. 1/6 of resin in pill when temperature and pulse are high; it tends to induce prostration, collapse, etc. (A). **Blisters,** flying blisters to chest, and perhaps along the pneumogastric in hypostatic congestion (R). **Copaiba,** exercises a powerful influence over the pulmonary mucous membrane, and is beneficial in lung diseases generally, when attended with excessive secretion (Wa). **Jaborandi,** is serviceable for the attacks of breathlessness attendant on lung affections, but must be watched lest collapse ensue (Berkart). **Liquor Potassæ,** in doses of ♏x–xv added to an ordinary expectorant mixture, is often attended with good results in congestions of bronchi and lungs, chronic bronchitis, plastic bronchitis, etc. (Walshe). **Cimicifuga,** is a useful sedative in many irritative affections of the lungs and bronchial tubes, relieving cough, improving appetite, and ameliorating the general condition (Wood). **Croton Oil,** as liniment, is a highly useful counter-irritant in many chronic lung diseases, and even in the bronchitis of infancy (Park). **Cubeb,** in small and oft-repeated doses, is efficient in chronic bronchitis and other lung affections of old persons, checking the excessive secretion and gently stimulating the system (Wa). [Compare BRONCHITIS, EMPHYSEMA, HEMOPTYSIS, PHTHISIS, PLEURITIS, PLEURODYNIA, PNEUMONIA.]

Lungs, Gangrene of.

Creosote, by inhalation, to obviate the fetor (R). **Carbolic Acid** inhalations, are used with marked benefit (Wa). **Mineral Acids,** especially Nitro-hydrochloric, with **Quinine,** the main reliances in chronic pulmonary gangrene (A). **Stimulants,** as malt liquors, with general tonic treatment, are necessary (A). **Ammonium Carbonate,** one of the most reliable remedies; is best given in decoction of Cinchona (Wa). **Eucalyptus,** the Oil with Alcohol, equal parts of each, of which ʒj as inhalation by steam atomization, is useful (Wa). **Turpentine,** the spirit on boiling water inhaled for fifteen minutes every two hours, successfully employed (Skoda). [Compare PNEUMONIA, PHTHISIS.]

Lupus.

Arsenic, in chronic cases not of syphilitic origin. Fowler's solution long continued exerts a curative influence, also Arsenous Acid locally (B); the best remedy in lupus of the head and face (Wa); the Oleate in ulcerating forms, constantly applied, will destroy cell infiltration in a mild and comparatively painless manner; it is also well employed in the tubercular variety (Id). **Phosphorus,** as an internal remedy, may be used as a substitute for arsenic (B). **Aurum Arsenate,** internally, is said to be serviceable. **Aurum** salts, locally and internally, have proved curative; the Chloride has been used as a caustic (P). **Iodine** is useful in lupus, whether syphilitic or scrofulous, the tincture or a glycerin solution locally (Hebra); the tincture or liniment applied to the edges and around them (R); it may also be employed internally. **Aristol,** has given excellent results locally as a dressing (Eichoff). **Strontium Iodide,** has been used in lupus vulgaris with varied results. **Calcium Chloride** internally, has proved curative, but must be taken for a long time. **Mercury**, in small doses, is one of the constitutional remedies which should receive a fair trial (Whitla); as ointment in lupus erythematosus, and in form of Calomel ointment in scrofulous and tubercular lupus of children (R); internally Calomel in doses of 1 to 2 grains increased to 4 grains, will quickly check it (Wa); the Emplastrum Hydrargyri is very efficient in lupus erythematosus and allied affections (Kohn). **Salicylic Acid**, is the most typical member of the group of agents which have selective action on the new growth and destroy it with the least amount of injury to healthy tissue (Whitla); used as a paste, made by rubbing it with an equal part of Creosote, applied daily after using a strong solution, 10 to 20 per cent. of Cocaine over the part; or Unna's plaster mulls, containing these two ingredients, may be used (Id); as dressing, Salicylic Acid 5, Creosote 5, Glycerinum Saponatum 90, after destruction of the growth, has given good results where no scraping nor any other operation was performed (Hebra). **Lactic Acid**, seeks out the diseased tissue, as a dog does game, surely finds it and effectually destroys it (Hortmann); the concentrated acid should be used, either alone or as a paste made with Kaolin. **Lead**, the Liquor Plumbi, with 1 or 2 of glycerin, in the milder forms, applied warm after the removal of the crusts (R). **Jequirity**, is a good application to destroy the diseased tissue by setting up the jequirity inflammation (Shoemaker). **Sodium Ethylate**, on absorbent cotton, is the best of the caustics, followed by Bismuth Oleo-palmitate as a soothing and astringent application (Id). **Carbolic Acid**, the crystals melted by heat, as a mild escharotic (B); its action is very superficial. **Zinc Sulphate**, dried, freely dusted over the surface as a caustic, followed by a poultice to remove the slough (B). **Silver Nitrate**, a weak solution gradually strengthened, may be used in superficial forms (R). **Chromic Acid**, in solution, 100 grains to the ℥ of distilled water, is an efficient escharotic (B). **Thyroid Extract**, has been used as a stimulant of the cutaneous functional activity with most satisfactory results. **Tuberculin**, in this disease has excited great interest, but the best authorities deny that its use has produced a single absolute cure; yet combined with surgical methods it will give good results (Whitla). **Scraping** off the diseased tissue with Volkmann's spoon under anesthesia, is the most radical and satisfactory of the mechanical procedures (Id); the Paquelin cautery is better than the spoon for removing the morbid tissue (Unna). **Electrolysis**, has given good results in Jackson's hands, who reports that the electrolytic action of the current seems to expend itself only on the diseased tissue. **Cauterization**, with the actual cautery at white heat, after scraping out as much as possible of the diseased tissue, so as to destroy the lupus cell. Seek to replace the lesion by a cicatrix, to prevent relapse in situ, and the development of the disease elsewhere. Internal remedies are only useful for the general health, and have no specific action on the disease. **Phototherapy**, by bringing the concentrated chemical rays of solar or electric light upon the lupus patch, thereby destroying the tubercle bacilli (Finsen); has given striking results in some cases, but is uncertain, slow and very expensive (Anderson).

℞. Iodi,
Potassii Iodidi, ... aa ℥ss.
Glycerini, ... ʒj.
M. Sig.—Locally in lupus.
(*McCall Anderson.*)

℞. Ung. Arseni Oleat., . . . ʒij.
Ung. Simplicis, ... ʒj.
M. ft. unguentum. Sig.—Use constantly over the affected surface. If pain sets in Opium may be added. (*Shoemaker.*)

℞. Hydrargyri Bromidi, . . ʒjss.
Adipis, ... ʒv.
M. ft. unguentum. Sig.—To cover the part affected, using Cod-liver Oil freely, and the following solution internally. In tubercular lupus of the face. (*Hardy.*)

℞. Potassii Iodidi, ... gr. lxxv.
Sodii Chloridi, ... ℥ss.
Aq. Destil., ... ℥viijss.
M. Sig.—Teasp. before meals, night and morning. (*Hardy.*)

Lymphadenoma—Hodgkin's Disease.

Arsenic is by far the most successful remedy, both in acute and chronic cases, several having been recorded in which the glandular swellings have disappeared and the patients have recovered under its influence (Murray); large doses, ♏xv–xx of Fowler's solution, arrived at by gradual increase, should be maintained until some physiological effect is produced (Ty); injected into the lymphoid masses has given good results, especially when not well borne by the stomach (Id). **Phosphorus**, has had good effects in a few cases, and should be used if arsenic is not well borne (Gowers). **Iodine** and **Potassium Iodide**, have been used but with little benefit; the latter may be distinctly harmful (Murray). **Quinine, Iron** and **Cod-liver Oil**, as tonics; every means must be employed to support the patient's strength (O). **Organic Extracts**, of spleen, thymus and other glands, are being tried but with no very decisive results as yet (Murray). **Bone-marrow** is perhaps worthy of trial, ℥j of fresh ox marrow thrice daily for an adult (Id). **Local Treatment**, by applications to or injections into the diseased glands, has reduced their size but has no influence on the progress of the disease (Id); is of doubtful benefit (O). **Extirpation** of the diseased glands, in suitable cases, especially where the enlargement is confined to one group, when the spleen is not greatly enlarged and when there is neither fever nor marked anemia, may arrest the disease and is the proper treatment (Murray); if the number of red corpuscles is below 60 per cent. removal should not be attempted (Gowers). [Compare ANEMIA, LEUCOCYTHEMIA.]

Lymphangitis.

Belladonna, the extract softened with glycerin and freely applied, is of great service; when pain is severe a poultice may be applied over the extract for a few hours only (Wa). **Lead**, Liq. Plumbi Subacet. Dilutus, as an external application, constantly applied, to soothe and restrain the inflammation (Wa). **Iodine**, in strong tincture, applied around the glands, to prevent suppuration (Roberts). **Quinine**, or **Salicin**, with alcoholic stimulants freely, in septic cases (Id). [Compare BUBO.]

Malaria, Chronic.

Arsenic plays an important rôle in chronic malarial disease (B); diminishes splenic engorgement, and combined with Iron is rapidly curative of many affections due to malaria (Boudin); is a powerful prophylactic against malaria, and in chronic malarial poisoning, with frequent return of fever and neuralgia, its continued use is of great benefit (Fayrer). **Quinine**, is less curative than when the infection is recent, but in periodical affections depending on the malarial cachexia it is of specific value, large doses being required (B); the indiscriminate use of quinine as a prophylactic in malarial countries is attended with great danger, seriously weakening the action of the heart and so inuring the subject to its action that it has no longer any value of importance as a remedy (Koch). **Salicylates**, of Quinine and Cinchonidine are especially effective in chronic malarial disease (B). **Iron**, the Sulphate has decided antiperiodic power, and is particularly successful in anemic subjects and in those with enlargement of the spleen (Wa); it improves the anemia of chronic malaria, and should generally be combined with Arsenic (B). **Iron and Manganese Iodide**, the syrup in doses of ♏xx–xxx, is a successful remedy for chronic malaria (B). **Manganese Sulphate**, gives excellent results in jaundice of malarial origin (B). **Cornus, Calumba**, and other bitters are highly efficient, especially the first named, in chronic malarial poisoning and in convalescence after malarial [illegible]ver (B). **Carbolic Acid** and **Iodine** combined, are of great value in chronic malarial infection; both are highly antiperiodic, and the latter is the best substitute for Quinine and the most active reducer of splenic enlargement (Gimwell). **Eucalyptus**, is of high utility to reconstruct damages in the organs of assimilation (B). **Nuclein**, has been used with benefit (Vaughn). **Baths**, the vapor-bath and Turkish baths are efficient aids to medicinal treatment in breaking up chronic cases, and may of themselves cure such by inducing profuse perspiration (Da C). [Compare HEMOGLOBINURIC FEVER, INTERMITTENT FEVER, REMITTENT FEVER.]

℞. Cinchonidinæ Salicylat., . ʒij.
Acidi Arsenosi, ... gr. j.
Ferri Sulph. Exsiccat., . . gr. xx.
M. ft. pulv. no. xx. Sig.—One powder in wafer thrice daily.

℞. Cornus,
Calumbæ,
Liriodendri,
Pruni Virginianæ, . . aa ℥vj.
Eupatorii,
Capsici, ... aa ℥iv.
Pulv. et misce. Sig.—A teasp. in cold or warm water, three or four times daily. A good tonic tincture may be made from the above combination. (B.)

℞. Quininæ Sulph., ... gr. xl.
Ferri Sulph. Exsic., . . . gr. xx.
Acidi Arsenosi, ... gr. j.
M. ft. pil. no. xx. Sig.—One pill thrice daily.

℞. Tinct. Iodi, ... ʒij.
Acidi Carbolici, ... ʒj.
M. Sig.—Two or three drops three or four times a day, in water.

℞. Acidi Arsenosi, ... gr. j.
Mass. Ferri Carbonatis, . ʒj.
M. ft. pil. no. xx. Sig.—One pill thrice daily.

Mania.

Stramonium, of value; allays irritation and induces tranquil sleep; in wild and furious but intermittent delirium, also in nymphomania (P); many facts seem to confirm its reported value (Tr). **Daturine**, gr. $\frac{1}{100}$–$\frac{1}{60}$ hypodermically in acute mania, but is less useful than Atropine or Hyoscyamine (Wa). **Duboisine**, gr. $\frac{1}{32}$ hypodermically in acute mania (Gubler); is more sedative and hypnotic than the other alkaloids of the group and acts well in doses of gr. $\frac{1}{100}$ at first, gradually increased to gr. $\frac{1}{30}$. **Belladonna** is useful, especially in monomania with fixed hallucinations, though a large dose causes a temporary insanity (Tr); one of the very best remedies in all hyperemic conditions of the brain (P). **Hyoscyamus**, in violent intermittent forms, to procure sleep and calm violent delirium (R); delirium with hallucinations but not congestion; in milder and less inflammatory forms, also in hypochondriacal monomania (P). **Hyoscine**, finds its greatest and most useful application in the treatment of maniacal violence and noisiness, and is a drug for emergencies of this kind (Weatherly). [See under INSANITY.] **Veratrum Viride**, successfully combats the excitement in acute mania (B). **Camphor**, has been used successfully; its action is uncertain (P). **Opium** with Tartar Emetic is satisfactory for many cases; also Morphine hypodermically to induce sleep (R); its narcotic effect is of doubtful utility, better in insanity with depression (P); will not produce narcotism in many such cases, even in 2-grain doses. **Bromides** are used in puerperal mania, that of pregnancy, nymphomania and other forms (R); the combined use of Potassium Bromide and Tinct. of Cannabis Indica, equal parts, ʒj of each thrice daily for weeks and months, has proved very efficient in acute and periodical mania, senile mania, and other forms (Clouston). **Chloral**, as calmative and hypnotic, has induced mental improvement (B). **Paraldehyde**, as a hypnotic, in doses of ʒss–j, is often decidedly useful (R); larger doses are necessary, an average one is ʒiss. **Coniïne**, most suitable to acute mania, quiets muscular action; doses of ♏ss–iij, or hypodermically, beginning with gr. $\frac{1}{10}$; with Morphine conjointly injected, is very successful (R). **Digitalis**, ʒss–ʒj of tinct. valuable in acute and chronic mania, especially when complicated with general paresis and epilepsy (Maudsley); caution! watch the pulse for any marked intermittence (B); a very valuable palliative in acute mania (Van der Kolk). **Ergot**, large doses, ʒss–j of fluid extract, to reduce excitement, shorten attacks, widen intervals between them, and prevent exhaustion, hence is very useful in recurrent and epileptic forms, and in chronic mania with lucid intervals (Crichton Browne). **Iron**, as a restorative, is frequently used in chronic mania with benefit, the tincture of the Chloride in 5–10 minim doses (B). **Gelsemium**, is useful in mania with great motor excitement and wakefulness; large doses required, ♏xv–xx of tincture. **Croton Oil**, as a purgative, ♏¼–⅓ every hour, as revulsive in mania from cerebral congestion (R). **Cimicifuga**, is often efficiently used in cases of mania occurring during the puerperal or pregnant condition (R). **Chloroform**, may be necessary to control very violent cases temporarily; its inhalation need not be carried to complete anesthesia. **Galvanism**, of the head and cervical sympathetic, has produced distinct improvement (B). **Cold Douche**, in maniacal delirium, the patient being in a warm bath during the application of the douche to the head (R). **Removal** from home, from sympathetic friends, and from surroundings connected with the origin of the malady, is a prime necessity to a cure. [Compare DELIRIUM, INSANITY, PUERPERAL MANIA.]

Mastitis.

Belladonna, Atropine locally [see LACTATION], or combined with Morphine and Chloral, when much pain (B); especially as liniment to check secretion of milk when inflammation is imminent (R); or when breasts are distended by milk (P); when inflammation has set in, continuous application of Belladonna for 24 hours often arrests it; also useful when abscess has formed; fomentations in addition, but skin must be dried well before the Belladonna is rubbed in (R); ♏v–x of tinct. internally as well (P). **Camphor**, a saturated solution in glycerin locally, in mammary congestion threatening abscess (Wa). **Phytolacca**, has power to arrest inflammation of the mammæ and to prevent suppuration; the fluid extract in 10-minim doses internally, and the solid extract to the inflamed breast (B). **Conium**, the extract in small doses several times a day, of striking benefit in mastitis and impending abscess of breast (Wa). **Calcium Sulphide**, internally in mammary abscess; occasionally increases pain (R). **Hyoscyamus**, as plaster, to relieve painful distention from milk (P). **Stramonium**, fresh leaves as cataplasm to discuss indurated milk (P). **Iodine**, tinct. and ointment to remove indurations of breasts after inflammation (B). **Mercury** and **Morphine**, the Oleate locally in mammary abscess (R). **Tobacco** leaves, as poultice in abscess (R). **Digitalis**, the infusion locally as fomentation in severe inflammation of the breasts, causes it to yield speedily (Fairbank). **Ammonium Chloride**, ʒj in Spt. Rosmarini Oj, as lotion on linen cloths, constantly applied, especially in induration after the abscess has suppurated (Wa). **Tartar Emetic**, in small and frequent doses, given early, is beneficial (Wa). **Oil** frictions in first stage of inflammation of breasts, from circumference towards the nipple (L). **Rest**, by supporting mammæ with strips of plaster, and bandaging the arm to the side, to prevent motion (T). **Alcohol**, over proof, applied by sponging until part is cold; renew if high heat returns. **Heat**, applied by a basin lined with flannel saturated with hot water, to relieve pain and prevent suppuration. [Compare ABSCESS, LACTATION.]

Mastodynia.

Conium, has specific anodyne action on the mammæ and generative organs. **Cimicifuga**, relieves infra-mammary pains of uterine origin in spinsters. **Olive Oil** [illegible] parts, to 1 of Tinctura Opii, may be used by gentle friction to painful [illegible] after parturition (Parvin). **Non-interference** is best in simple cases of enlargement and tenderness, which will spontaneously subside if let alone; in severe cases support by strips or bandage, if breast pendulous; Belladonna ointment or liniments; amputation of the breast has been necessary (T).

Measles.

Aconite, for febrile symptoms, and especially to arrest the catarrhal pneumonia (R); a valuable remedy (P); the best drug when fever is very high, ½-drop doses of the tincture every 2 hours (Da C). **Jaborandi**, with a hot bath, as a diaphoretic in cases of delayed eruption (Da C). **Asclepias**, an infusion or decoction freely as a diaphoretic to promote the eruption (W). **Veratrum Viride**, has been employed (R). **Pulsatilla**, for the catarrhal ophthalmia, nasal and intestinal catarrh; ʒj–ij of tincture to ℥iv water as wash (P). **Ammonium Carbonate**, dissolved in a solution of the Acetate, is much vaunted; when feeble circulation, cyanosis, delirium, gr. v–x to ℥ss–℥j Liq. Ammonii Acetatis (B); gr. iij–vj or vij, every hour or two, in Cinnamon-water or milk; one of the reliable remedies (W). **Camphor**, the water with Liq. Ammon. Acetatis, excellent when cough and catarrh the most urgent symptoms (A). **Ipecacuanha**, for cough and catarrh, gr. j–ij every 4 or 6 hours (A). **Antimony**, preferred to Ipecac by some (A). **Quinine**, in small doses, gr. j–iij, for the adynamia, or large, gr. xv, for hyperpyrexia and catarrhal pneumonia (B). **Carbolic Acid**, has been employed in several hundred cases with decided advantage; most useful at early stage (Wa). **Cod-liver Oil** and **Iron**, to scrofulous children, a long course of such medication after convalescence (Da C). **Purgatives**, must be given with caution (R); the milder purging salts, as Magnesium Sulphate, to be preferred (A). **Mustard**, as bath on sudden retrocession of rash (R); often increases the fever without benefiting the pneumonia or other complications (A). **Water**, cold affusion at commencement; packing, especially when retrocedent (R); hot foot-baths for convulsions (A); tepid bath with cold douche to head, if cerebral symptoms are severe (Da C). **Oil Inunctions**, Cacao-butter is very grateful and reduces temperature; also in the roseola (B); hands and feet to be rubbed with a firm fat to remove heat and tightness produced by rash (R). **Aliment**, low diet and slops; no animal food during the whole course (A). **Hygiene**, dark room, complete disuse of eyes, strict cleanliness (A). [For Sequelæ see BRONCHITIS, COUGH, OPHTHALMIA, OTORRHEA, PNEUMONIA, etc.]

℞. Acidi Carbolici,
Acidi Acetici, ... āā ʒj–ʒjss.
Tinct. Opii Deodorati,
Spt. Chloroformi, . . . āā ℥j.
Aquæ, ... q. s. *ad* ℥viij.
M. Sig.—A tablespoonful every 4 hours, until fever abates. (*Keith.*)

℞. Tinct. Tolutanæ, ... ℥ij.
Syr. Senegæ, ... ℥ss.
Acidi Acetici, ... ℥jss.
Syr. Pruni Virg., q. s. *ad* ℥iv.
M. Sig.—A teaspoonful as required for cough after convalescence.

Melancholia.

Aurum, gives excellent results, gr. $\frac{1}{30}$ to $\frac{1}{20}$ of the Chloride thrice daily, especially when cerebral anemia coexists (B); the Bromide of Gold and Arsenic has rendered good service in many cases, ♏x hypodermically thrice daily: Gold is highly recommended in suicidal melancholia. **Bromides**, sometimes afford relief which no other agent will; no indications (B); Potassium Bromide for townspeople, especially women with unendurable despondency (R). **Arsenic**, gives great comfort in the melancholia of aged persons, is best when combined with small doses of opium, thus—Liq. Potas. Arsenit. ♏ij, Tinct. Opii, ♏iij–v ter die (B). **Opium**, in stimulant doses of tincture, gives good effects (B); especially when paroxysms of acute anguish and despair, or when suicidal impulse (Wa); Morphine hypodermically is of great benefit in some persons who have a peculiar idiosyncrasy therefor (R). **Camphor** has been highly recommended (R). **Musk** and **Castoreum** are employed in melancholia with benefit (R). **Cannabis Indica**, sometimes relieves (B). **Phosphorus**, depression from overwork (R). **Chloral**, as hypnotic, has been followed by marked amelioration and cure (Wa). **Valerian**, in hysterical or suicidal melancholia, is often beneficial (Wa). **Caffeine** has been useful (B). **Iron**, as restorative, the tincture of the Chloride (B). **Cocaine**, a useful tonic and especially beneficial in nervous affections accompanied by depression (Br). **Cimicifuga**, in puerperal or uterine despondency, of singular value (P). **Ignatia**, has soothing effect in great mental depression (P). **Orchitic Extract**, has been used with benefit. **Water-cure**, shower-bath for 15–20 seconds, or warm-bath, 95° F. for 30 minutes; the shower or cold douche may be usefully employed in cases where reaction takes place after it (W). [Compare HYPOCHONDRIASIS, HYSTERIA, INSANITY.

Meningitis, Cerebral.

Aconite, is as serviceable in this as in the other acute inflammations; during the stage of excitation, the tincture, gtt. ij with gtt. v of the tincture of Opium, every 2 hours, gives admirable results (B). **Belladonna**, in all hyperemic conditions of brain and spinal cord one of the very best remedies, especially during the period of excitement (P). **Hyoscyamus**, valuable in subacute form (P); for nervous irritability during convalescence (A). **Gelsemium**, extremely useful; ♏v of fluid extract every 2 hours (B). **Mercury**, as ointment gives good results in children (A); Calomel in small, frequent doses, so as to bring the system under it quickly, a most valuable remedy apart from its purgative effects (W); the Unguentum Hydrargyri rubbed for 30 minutes into the skin on the front of the abdomen, groins and arm-pits, repeated after 12 hours if no evidences of improvement or salivation; such unmistakable benefits follow the free use of mercury that to withhold this remedy in desperate or apparently hopeless cases is unjustifiable (Whitla). **Potassium Iodide** in large doses where vomiting and gastric derangement are absent, and in the later stages of syphilitic meningitis may be very valuable (Id); has cured (Niemeyer). **Ergot**, the fluid extract in ʒss doses with an equal quantity of Potassium Bromide, every four hours, to diminish the vascular excitement (B). **Potassium Bromide**, in the convulsions following simple meningitis (R). **Opium**, in small doses; by clinical evidence proved to be the best remedy, especially for acute stage before exudation, or during the stage of excitation (B): when collapse, it may sustain the vital powers; with Tartar Emetic has proved most beneficial, but should be used with caution, as it may do great harm (Wa). **Bryonia**, exceedingly valuable for serous inflammations in stage of effusion (P). **Pulsatilla**, valuable in the acute form (B). **Purgatives**, as soon as possible, unless exhaustion; Calomel and Jalap the most active and searching (A); Croton Oil as a derivative and revulsive, also locally to the shaven scalp is productive of the best results (Wa). **Venesection**, or arteriotomy (temporal artery) gives good results (B); when high cerebral excitement and vascular action (A). **Blisters**, on nape of neck if coma, after active symptoms are subdued (A): useless, and cause needless suffering (O). **Water**, cold water for hyperpyrexia (C); pounded ice in bag or bladder, as a cap to the head (R). There are no remedies which in any way control the course of acute meningitis (O). [Compare MENINGITIS, TUBERCULAR.]

Meningitis, Cerebro-Spinal.

Opium, in small doses is the most effective remedy; its utility ends when effusion occurs and stupor and coma ensue (R); large doses (Valleix); gr. j every hour in very severe cases (S); has been used in France and Germany with much success (Tr); is the best remedy of all, gr. j every hour for 4 days, even such doses will not narcotize (Da C). **Antipyrin**, has rendered good service. **Aconite**, is useful combined with Opium (B); affects the cranio-spinal axis from 3d nerve to phrenics, the region where this disease is most manifest (Harley). **Gelsemium**, extremely valuable, ♏v of fluid extract every 2 hours, to maintain constant physiological effect (B); is efficient for the delirium. **Belladonna**, in all hyperemic conditions of brain and spinal cord, especially during stage of excitement (P). **Iron**, the tincture of the Chloride, in 20–30 minim doses, every two hours, suggested by the similarity of the disease to erysipelas, has made many successful cures without leaving any sequelæ (Klapp). **Bromides**, to guard the Opium and enable the latter to be pushed, 20-grain doses every 4 hours (Da C). **Hydrocyanic Acid**, dilute, ♏j–ij, with gr. iij–v of Sodium Bicarbonate, every 3 or 4 hours for severe vomiting (Delafield). **Quinine**, in large doses at the commencement (B); has been exhaustively tried in this disease and failed (Da C). **Potassium Iodide** for the sequelæ, a long course of Iodides during convalescence is the best treatment (Da C). **Cold** to the spine, the most satisfactory treatment (Radcliffe); to head and upper spine for 5 minutes only at a time, for the headache and tetanic symptoms (Da C). **Venesection**, or arteriotomy (temporal artery), probably of service, but cautiously (B); leeches at back of neck and on temples, to relieve the terrible headache, if patient is strong and vigorous (Da C). **Digitalis**, in early stage (Rummel). **Ergot**, one of the best remedies (B). **Turpentine**, enema, as derivative (B). **Stimulants**, in small quantities (A). **Counter-irritation**, by actual cautery freely applied to back, alleviates pain (A). **Water**, cold baths or wet pack for hyperpyrexia (B); hot-water bottles or sand-bags to trunk and extremities to keep up warmth; bath of 102–106° for short time only, then wrap in blankets (A). **Heat** to the body, except the head and neck (Da C). **Aliment**, nutritious and suitable food at short intervals, day and night (A); tonics with fresh air and good diet during convalescence (A). **Ventilation**, of dwellings, the best sanitary precaution when the disease is epidemic (Simon).

℞. Morphinæ Sulph., . . . gr. ss.
Ac. Sulphurici Aromat., ʒj.
Tinct. Cinchonæ Co., *ad* ℥vj.
M. Sig.—Tablesp. every 2 hours, for a boy 12 years old. (*Meigs & Pepper.*)

℞. Potass. Iodidi, ... ʒiv.
Tinct. Gentian. Comp.,
Syr. Sarsaparillæ Co., . āā ℥ij.
M. Sig.—Teasp. thrice daily, to promote absorption during convalescence.

Meningitis, Spinal.

Aconite, is very useful (B); with an Ergot and Opium impression to reduce the amount of blood in the vessels of the cord (Da C). **Potassium Iodide**, in the chronic form, with the Bichloride of Mercury when a specific history present (Hammond). **Belladonna**, strongly to be relied on, even when brought on by external violence (P). **Bryonia**, in serous inflammations when effusion, is extremely valuable (P). **Purging**, by Magnesium Sulphate, combined with Tinct. Hyoscyami (A). **Quinine**, when paralysis occurs, in 3-grain doses thrice daily, with ¼-grain doses of Ext. Belladonnæ, or 20–30-grain doses of Potassium Iodide, and flying blisters along the spine (Da C). **Opium**, in some form, must be used for pain (Bastian). **Mercury**, gr. $\frac{1}{16}$ of the Bichloride, with increasing doses of Potassium Iodide, to promote absorption of inflammatory products, if the inflammation subsides (Bastian); a mercurial impression often benefits the paralysis (Da C). Mercury is the only drug which has any influence on the acute process; it is best given by inunction (Risien Russell). **Cold**, by ice to spine is deemed necessary, and no doubt alleviates the pain, though heat would be a more rational application for the inflammation (Bastian).

Meningitis, Tubercular.

Potassium Iodide, is the routine remedy, to be administered in ordinary typical cases, full and frequently repeated doses are necessary, gr. j every 2 hours for a child of 2 years (Whitla). **Iodine,** lotions to scalp, or inunction of Iodine ointment together with Ferrous Iodide and Cod-liver Oil internally, offer the best chance of success, although most remedies often fail (Wa). **Potassium Bromide,** combined with the Iodide in double the dose of the latter, is advantageous (Whitla). **Tartar Emetic,** the oint. as counter-irritant to scalp in tubercular meningitis (R); in large doses internally was formerly employed (Wa). **Croton Oil,** is said to have removed the excess of fluid from the ventricles (R); as a derivative and revulsive, also locally to the shaven scalp, is productive of the best results (Wa). **Mercury,** Hydrarg. Chlor. Corr., in doses of gr. $\frac{1}{30}$ to $\frac{1}{16}$, has proved successful (Wa). Mercury by inunction should be used heroically as long as there is any reason to doubt the diagnosis, in the hope that the case may be one of simple meningitis (Whitla). **Magnesium Carbonate,** ʒj–ij saturated with Lemon-juice, every 2 or 3 hours, a useful purgative in hydrocephalus (Wa). **Turpentine,** in doses of ♏v–x with ♏xx–xl of Castor Oil, or terebinthinate enemata, in incipient hydrocephalus (Wa). **Purgatives,** in small doses, every 4 or 6 hours after having overcome the constipation, to maintain action for some days; a single dose of Calomel, followed up by Magnesium Sulphate at short intervals; their value can hardly be overrated (Wa). **Leeches,** on crown of head rather than on temples, when much febrile action; inadmissible if patient is much debilitated; sometimes serviceable (Wa). Cases of recovery have been reported by reliable authorities, but they are extremely rare, and there is always a reasonable doubt as to the correctness of the diagnosis. **I have never seen a case recover which I regarded as tuberculous (O).**

Menorrhagia.

Opium, has specific action in reducing the uterine circulation and should be pushed, even to inducing habit, in severe cases (Lutaud). **Ipecacuanha,** in full emetic doses (Wa); is excellent (B); Ergot is better (P). **Savine,** enlarged, relaxed, and passively congested uterus (B); in 5–10 drop doses of tinct. in water every half-hour to three hours, has proved useful (P); when menorrhagia due to want of tone in uterus (R). **Ergot,** large spongy uterus; Bromides better (B); Ergotin, gr. j or ij in glycerin and water, undoubtedly efficacious as hypodermic injection (P); in all forms (R); minim doses of the fluid extract are very beneficial (Smith). **Hydrastinine,** a powerful uterine vaso-constrictor; successfully used in grain doses of the Hydrochlorate in 10 per cent. solution hypodermically, for a few days before the expected term. **Hamamelis,** has decided influence on venous system; of high repute (Pf). **Arsenic and Iron,** when from anemia (B). **Cannabis Indica,** often successful (R); gtt. v–x of tinct., thrice daily, productive of extraordinary success (Wa); has a stimulant action on the uterine muscular fibre, and may be given in combination with Ergot (B). **Iron,** when dependent on anemia (B). **Rue,** low vascular tonus; should never be used in the pregnant state (B). **Erigeron,** the Oil, in 10-drop doses, is efficient (Wa). **Gossypium,** a favorite uterine hemostatic in many hospitals, 30-minim doses of the fluid extract every four hours (Parvin). **Quinine,** has been recommended (R); after Ergot it is the best agent, in 6-grain doses every 3 hours (Parvin). **Digitalis,** very useful, especially when from heart disease, in plethoric subjects (R); ℥j–jss of infusion will arrest menorrhagia when unconnected with disease (P, R). **Aloes,** with Iron in debilitated and relaxed subjects (B). **Cimicifuga,** passive, coagulated and dark (P); for accompanying headache (R). **Gallic Acid,** is very efficient (R). **Potassium Chlorate or Bromide,** in doses of gr. xv thrice daily, combined with Ergot, has an almost infallible influence over uterine hemorrhage, unless caused by cancer, polypi, adherent placenta, or other similar affections (Tait). **Bromides**, usually arrest promptly (B); that of Potassium most useful in young women if loss occurs at period only; commence the Bromide a week before and discontinue when discharge ceases till a week before the next term; if loss occurs every two or three weeks give Bromides continuously in 10-grain doses, but more when organic changes in womb (R, Wa). **Ammonium Chloride**, for headaches (R). **Calcium Phosphate**, in anemia from excessive menstruation (R). **Magnesium Sulphate**, very small doses with a little dilute Sulphuric Acid and syrup, is exceedingly useful (Wa). **Cinnamon**, the Oil, in drachm doses (R). **Mammary Extract**, gave signal satisfaction as an internal remedy in two cases of menorrhagia with dysmenorrhea and enlarged uterus (Bell). **Water**, hot water bag to lower dorsal and lumbar vertebræ (R); cold sitz-bath, feet in warm water, especially valuable; 60°–65° F., for 5–15 minutes, patient then quickly dried and put to bed. [Compare METRORRHAGIA.]

℞. Ext. Ipecac. Fl., ... ʒij.
Ext. Ergotæ Fl., ... ʒiv.
Ext. Digitalis Fl., ... ʒij.
M. Sig.—A half teasp. to a teasp. as required until emesis occurs. (B.)

℞. Ext. Ergotæ (Squibb), . . gr. xij.
Ext. Opii, ... gr. vj.
M. et div. in pil. no. xij.
Sig.—One pill every hour, in profuse menstruation of atonic type.

Menstrual Disorders.

Aconite, gtt. j of tinct. every half-hour or hourly promptly restores the discharge when suddenly suppressed from chill (P, B, R, Wa); as emmenagogue (Tr). **Pulsatilla**, often of the greatest value when menses scanty or delayed, or suppressed by fright or chill (P, B). **Ignatia**, in the suppression of hysteria (P). **Savine**, a powerful uterine tonic; as emmenagogue certain, powerful, safe (P). **Ferrum**, in anemic subjects (B). **Aloes**, as emmenagogue [see AMENORRHEA]. **Cocculus Indicus**, for irregular menstruation with colicky pains and scanty discharge; should be given for a few days prior to and during period (P); ♏ij–iij of a saturated tincture thrice daily. **Opium**, in suppression from violent mental emotions, a valuable remedy (Wa); in many menstrual disorders it proves invaluable, but must be cautiously administered lest the habit be formed. **Cimicifuga**, relieves heat and pains in the head, flushings of the face, pains in back and limbs, etc., when occurring as the result of menstrual perversion (Wa). [Compare AMENORRHEA, DYSMENORRHEA, MENORRHAGIA, CLIMACTERIC DISORDERS.]

Mentagra.

Mercury, the Oleate, or the Bichloride, gr. ij to ℥j of water, applied as lotion after each epilation (R); Citrine oint. extensively employed (Wa). **Sulphurous Acid**, with an equal part of glycerin, an efficient application (Jenner). **Arsenic**, has powerful influence, used internally in doses of ♏v of Liquor Arsenicalis thrice daily (Wa); the Oleate of Arsenic is an efficient local application. **Sulphur Iodide**, as ointment, ʒj to ℥jss, is efficient, with Donovan's solution internally (Sir E. Wilson). **Copper Sulphate**, as lotion, ʒj to ℥xvj of water, with ℥ss of Zinc Sulphate, and ℥jss of Aqua Laurocerasi (B).

Metritis, Acute.

Opium, by suppositories or enema is more effectual than if administered internally (Wa). **Aconite**, is invaluable in early stage of simple inflammatory fevers (P). [Compare PUERPERAL FEVER.] **Heat**, to the feet, and by large poultice to the abdomen; also hot water vaginal injection literally for hours if possible, repeated at short intervals; the only means of aborting an attack of cellulitis (E), which is the condition generally present in cases which are usually supposed to be ones of acute metritis (Playfair). **Turpentine**, as hot epithems; few measures are more generally serviceable (Wa). **Linseed Poultices**, produce great relief to pain and favorably affect the course of the disease (Duncan). **Leeches**, to the hypogastric region, may be required in patients of full habit. [Compare PUERPERAL FEVER, PUERPERAL METRITIS.]

Metrorrhagia.

Opium, has specific action on the uterine circulation [see page 402], and should be given freely in intractable cases of metrorrhagia from uterine fibroids or cancer, in which the establishment of the opium-habit is often advisable (Lutaud). **Hydrastinine**, a powerful uterine vaso-constrictor; successfully employed in grain doses of the Hydrochlorate in 10 per cent. solution hypodermically. **Atropine**, gr. $\frac{1}{100}$ to $\frac{1}{50}$ hypodermically, in profuse metrorrhagia after abortion or of obscure origin; may require as many as four injections to cause cessation of the flow (Squibb). **Salipyrin**, in doses of gr. xv thrice daily, employed in fifty cases of metrorrhagia from various causes, with best results in cases following labor or abortion (Orthmann). **Ipecacuanha**, possesses considerable energy in arresting flooding (P); in full emetic doses, gr. xx in evening, followed by an acidulated draught in the morning (Wa). **Hamamelis**, when persistent oozing (R). **Ergot**, the most valuable remedy in full doses repeated every hour or so (R, P). [See MENORRHAGIA for formula.] **Savine**, 5 to 10-drop doses of tincture in cold water every ½ hour to 3 hours (P). **Iron**, styptic preparations as injections (B). [See HEMORRHAGE, POST-PARTUM.] **Cannabis Indica**, often arrests metrorrhagia especially when at climacteric; tincture gtt. v–xx ter die (P); has had extraordinary success in number and rapidity of cures (Wa). **Sulphuric Acid**, sometimes very effective, especially when due to fibroid or polypus; Ac. Sulphurici Dil., gtt. v–xx, well diluted (B); long and extensively prescribed (Wa). **Cinnamon**, is used with good effect (P); has specific action on the uterus (T). **Digitalis**, in plethoric subjects; the infusion best, a tablesp. bis die (P); the effect is prompt and decided (Wa). **Magnesium Sulphate**, often succeeds (B). **Senegin**, in 2-grain doses, is successfully employed (P). [Compare AMENORRHEA.] **Ice**, to abdomen, or within the uterus (B); Ice in every way the first thing to try (Wa). **Rest**, absolutely necessary. **Dry Cupping**, over the sacrum, is found useful (R). [Compare MENORRHAGIA, UTERINE TUMORS.]

℞. Ext. Ergotæ Fl., ... ℥ss.
Ext. Senec. Aur. Fl.,
Ext. Viburn. Prunif. Fl., aa ℥j.
Ol. Myristicæ, ... ♏xx.
Syr. Simplicis, . q. s. *ad* ℥vj.

M. Sig.—A dessertsp. every ¼ hour until relieved, then reduce the dose. Keep the head low, and apply cold over the hypogastrium.

Miliaria—Prickly Heat.

Carbolic Acid, a 4 or 5 per cent. solution in water, adding a little glycerin, is the best local application for the itching and prickly sensations. **Baths**, warm or containing Sulphides (R); sponge-baths with alkaline lotions, diluted lead-water, fluid extract of Grindelia well diluted, or a solution of Copper Sulphate gr. x to the ℥, with dusting powders of Lycopodium, Zinc Oxide or Starch, singly or combined (Hughes); fine rice powder makes an excellent application. **Diet** in severe cases should be simple, nutritious but not stimulating, alcohol is most deleterious (Pringle); it is most important to avoid all causes of perspiration, as the copious consumption of fluids, excessive exercise, close rooms and warm clothing (Mn). Prickly heat is a form of miliaria, not of lichen, and is due to the excessive sweating incident to the heat of tropical climates (Id). **Inunction** of the body after the morning bath, with vaselin or some fatty material, is prophylactic in persons who are subject to the affection (Pringle).

Miliary Fever.

Aconite, for the hyperpyrexia (R, P). **Cooling Drinks**, purgatives and antiphlogistics, in mild cases; malignant ones sometimes occur, and are dangerous (A). **Lime-water** applied by sponging, is very useful; or a lotion of Zinc Oxide suspended in Lime-water, gr. xl to ℥j, painted on the affected parts of the skin, and permitted to dry thereon (E. Wilson).

Muscæ Volitantes.

Potassium Iodide, very effectual in curing muscæ depending upon hepatic derangement (Wa). **Valerian**, often found curative (Wa). **Muscæ Volitantes** are due to shadows cast on the retina by fibrillæ floating in the vitreous body, and are most visible to myopic persons; they do not merit attention unless very abundant, or steadily increasing (C). Rest of the eye necessary. **Neutral-tint** glasses may be worn to render the muscæ less visible, if troublesome.

Myalgia.

Arnica, the best agent for contused muscular fibre; also for shake, concussion, shock; ♏v–x every 2 or 3 hours in water (P); a few drops of tincture internally, removes stiffness, after packing with cold, wet sheet (R). **Cimicifuga**, often succeeds wonderfully, as often fails; no indications for its use (B); general bruised sensation (R). **Ammonium Chloride**, in 10- to 20-grain doses, the most efficient remedy (Anstie); is effective (R). **Veratrine**, the ointment externally may control (B). **Belladonna**, as liniment, is often successful (R). **Gelsemium**, frequently cures, but large doses are necessary, ♏v–xx of the fluid extract every 3 hours (B). **Coca**, to relieve the sense of fatigue (P). **Opium**, by frictions or poultices (R). **Iodine**, ointment for pain and tender muscles of the chest, when skin may be pinched without pain (R). **Xanthoxylum**, externally and internally, has a deserved reputation (B). **Chloroform Liniment**, with friction, often affords great relief (Wa). **Firing**, sometimes very beneficial (B). **Packing**, with dripping wet sheet (R). **Counter-irritation**, by firing, aquapuncture, acupuncture (B). **Electricity**, the constant current (B). **Baths**, Turkish, in aching muscles, from over-exertion (R). **Poultices**, very hot, followed by applications of lint and oilskin (R). **Rest**, is the remedy, of course (Wa); rest and support to weak muscles are important until they regain tone; especially in painful muscular affections following prolonged or excessive exertion, or in the soreness or stiffness which occur during convalescence from any long illness, or accompanying general debility, and generally better after repose, but increased with fatigue. [Compare LUMBAGO, PLEURODYNIA.]

Myelitis.

Belladonna, is decidedly effective, especially when disease is brought on by external violence (P). **Ergot**, most successful: large doses are necessary (B). **Electricity**, in chronic, not in recent form (B). **Silver Nitrate**, in chronic inflammations of the cord, one of the few remedies which are ever of service; gr. ¼–½ (W). **Silver Phosphate**, of special value in myelitis with disturbance of bladder and rectum (Wa). **Sodium Phosphate**, hypodermically, was employed with great benefit in a case of syringo-myelitis [see page 421]. **Phosphorus**, of marked benefit in myelitic paraplegia from excessive venery (W). **Water-cure**, Ice-bag to spine, feet in hot water; or better, hot douche to spine (B). **Cold**, externally, by ice-bags along the spine, with cupping or leeching if much localized pain or tenderness; spoon feeding and a sparing amount of stimulants, also copious warm enemata to relieve the bowels and act as derivatives. Little, if anything, is to be done with drugs. Posture should be prone, or on side; absolute rest (Bastian). [Compare MENINGITIS SPINAL, PARALYSIS.]

Myopia.

Atropine, by daily instillation, systemically, for the purpose of sacrificing either the convergence or the accommodation, in cases where failure of the internal recti occurs, the disability assuming the form of muscular asthenopia (C). **Glasses**, properly adjusted, should be worn from the commencement. **Extraction of the Lens**, produces the happiest results in extreme myopia, especially when progressive, since by removal of the crystalline lens the refraction of a very myopic eye is brought back nearly to emmetropia (Valude).

Myxedema.

Thyroid Extract, or the thyroid gland itself, fed to the patient daily, is now the recognized treatment, and produces the best results (see page 157). **Tonics**, as Iron, Arsenic and the Hypophosphites, with diaphoretic drugs, as Jaborandi, and daily baths, formed the early treatment of this affection (Ord). **Exposure to Cold**, aggravates all the symptoms and causes great weakness and depression, even though the patient is not conscious of any discomfort from the impact of cold air, by reason of the thickened and insensible condition of the skin. Even while reaping so great a benefit from the use of the thyroid, we are still bound to shield our patients from exposure to cold (Ord).

Nails, Ingrowing.

Liquor Potassæ, a solution, ʒij to ℥j, on cotton-wool, applied to margin of nail at ulcerated surface, to soften the nail in ingrowing toenail (B). **Glycerin**, or **Silver Nitrate**, on a fold of lint, to the ulcerated surface (C). **Lead Carbonate**, a piece softened between the fingers, and applied as plaster beneath the fungous cushion, cures in a few days (Tr). **Paring** the nail, after softening in warm water, and cutting a V-shaped incision in centre of nail; the ingrowing portion should not be cut.

Nasal Affections.

Ammonia, by inhalation, in pain and inflammations of nose and frontal bones (R). **Potassium Iodide**, large doses, gr. xxx–lxxv daily, valuable in syphilitic affections of the nose (Wa). **Glycerite of Tannin**, to excoriations of inside of nose, after measles, scarlatina, etc., also for impetiginous eruptions of inside; epilation sometimes needful; also in discharge of greenish, black, stinking mucus (R). **Glycerite of Starch**, or **Zinc Ointment**, applied often, a good supplementary application (R). **Hydrastis**, in chronic catarrhal conditions and nasal ulcers, used internally and externally with great benefit (P). **Pulsatilla**, may be employed both internally and externally in nasal inflammations (P), and in acute inflammation of nose (B). **Cod-liver Oil** for chronic discharge (R). **Adrenal Extract**, locally, has many valuable uses in congestions of the nasal passages, also as a styptic after operations [see page 165]. **Injections**, by nasal douche, are used with benefit in catarrhal states (Wa). **Zinc Chloride**, gr. ij to the ℥, or the Sulpho-carbolate, gr. v to the ℥, as solutions locally by cotton-wrapped probe to diminish sensibility of the nasal mucous membrane (Sajous). **Cocaine**, has many applications in treatment of nasal affections; a 4 per cent. solution by mop or spray will empty the en- d venous sinuses, and is very useful in acute catarrh, hay fever, etc., also terior and anterior rhinoscopy (R). [Compare ACNE, CATARRH, EPIS- HAY FEVER, INFLUENZA, OZENA, POLYPUS, SNEEZING.]

Nausea.

Carbolic Acid, or **Creosote,** is very useful in reflex nausea. **Hydrocyanic Acid,** ♏i–iv of the dilute acid in ℥j of water, is useful (Beale). **Ammonia,** ♏iij–iv of Liq. Ammoniæ in a winegl. of water when the feeling of nausea is most troublesome, may cure the ailment (Id). **Hydrargyrum,** a small dose of Blue Pill or Calomel will sometimes cure very obstinate nausea, although many other remedies have failed (Id). **Cocaine,** a 2 per cent. solution sprayed high into the nasal passages, so as to reach the terminal filaments of the olfactory branches, is specific against nausea, its influence lasting several hours (Ingraham). **Chloroform,** ♏ij–v on sugar, will relieve some kinds of nausea (B).

Ipecacuanha, has no rival in sickness of pregnancy, scarcely less useful in that of chronic alcoholism; very small doses, gr. $\frac{1}{32}$ of powder or ♏j of wine (P). **Pulsatilla,** in dyspeptic nausea, with coated tongue, flatulence, sick headache (P). **Cocculus Indicus,** in cephalic nausea, violent but ineffectual efforts at vomiting (P). **Calumba,** in nausea of languid stomach with flatulence, has considerable reputation (P). **Cinnamon** or **Cloves,** will check nausea (P). **Nutmeg,** the simple powder in wine (P). **Pimenta, Pepper, Peppermint,** relieve nausea (P). **Tartaric Acid,** as effervescing draught, with a few drops of Tinct. Opii, Tinct. Calumbæ, or Dilute Hydrocyanic Acid added, when from morbid gastric irritation (Wa). **Bismuth Subnitrate,** or the Liquor Bismuthi, when the salt in substance disagrees, is a remedy of established value in nausea and vomiting arising from gastric disorders; may be combined with Hydrocyanic Acid (Wa). **Counter-irritation,** by a mustard poultice applied over the region of the stomach and liver for 20 minutes every 3 or 4 days (Beale). **Heat,** hot water on spongio-piline, worn for an hour or two, will frequently be found efficacious (Id). **Cold,** by a compress or ice-bag, over the stomach, is often very useful. [Compare Dyspepsia, Headache bilious-sick, Seasickness, Vomiting of Pregnancy.]

Necrosis.

Sarsaparilla, a very useful medicine in diseases of the bones (P). **Rest,** in a Salter's swing, with poultices, water-dressings or stimulating lotions, to aid the work of repair (Cl, Hilton). **Tonics,** nutritious food, baths, good hygiene, all are necessary adjuncts to local treatment (Andrews). **Acid Solutions,** of no use as solvents, may be employed with benefit for detergent and alterative effects to expedite the sloughing and restorative processes (Gross). **Operation** to remove sequestrum is generally necessary; or resection of the devitalized bone, the latter in young subjects greatly exhausted, where delay would endanger life (Gross). **Potassa cum Calce** introduced into fistulæ, to convert them into large openings, permitting the removal of diseased bone (Kirkpatrick). [Compare Caries, Bone Diseases, Syphilis, Scrofulosis.]

Nervous Affections.

Nux Vomica, in one-drop doses of the tincture every 5 minutes, is promptly efficient in relieving many affections of reflex neurotic origin, as cough, dyspnea, syncope, palpitation, flatulent dyspepsia, eructations, etc., especially when occurring in hysterical subjects (Macfarlan). **Arsenic,** of especial value in nervous affections resulting from malaria, in which large doses are required; ♏x of Liq. Arsenicalis, increased to ♏xxx thrice daily (Wa). **Asafœtida,** is a remedy of much value in nervous affections connected with uterine derangement, also in dyspeptic hypochondriasis and other nervous affections; may be combined with bitter tonics and mild aperients (Wa). **Potassium Bromide,** takes precedence in epilepsy, epileptiform convulsions, hysterical convulsions and spasms, tetanus, etc.; is of great value in chorea, insanity, acute mania, insomnia, delirium tremens, some forms of neuralgia, and the numerous symptoms of vaso-motor disturbance, such as numbness, coldness, deadness, pricking sensations, indefinable but distressing sensations in abdomen, hypogastrium or epigastrium; feelings similar to rigors, with anxiety, palpitation or fluttering of the heart—all due to interference with the local circulation (Reynolds). **Valerian** and **Valerianates**, are thought to exercise some special influence over nervous affections, especially Zinc Valerianate, in half-grain to grain doses in pill, or the Ammoniated Tincture of Valerian, from which every good that can be expected from the valerianates will be more certainly obtained (W). **Sumbul**, acts as a nervous stimulant, and is especially efficacious in neurotic migraine, also in hysteria and the obscure paralytic affections associated therewith (Wa). **Caffeine**, is of signal value in neuralgia, hemicrania and other nervous affections (Shafter); grain-doses in solution hypodermically afford great relief in dorso-intercostal neuralgia attending shingles, insomnia, etc. (Anstie). **Cocaine** is a powerful nerve stimulant, destroying the sense of fatigue, and often evincing marked analgesic power in neuralgiæ; is effective in melancholia, hypochondriasis, etc., as well as locally in nerve pain over a limited area; it acts as an excitant upon the central nervous system (R). **Opium**, is a remedy of marked value in insanity, melancholia, mania, and all nervous affections accompanied by pain (W); gives general repose to both body and mind, is of decided value in diabetes, and produces marked improvement in melancholia and despondency (R). **Lupulin**, is peculiarly useful in nervous affections when Opium cannot be tolerated, especially in chronic hysteria attended with morbid vigilance, 10-grain doses every 6 hours afford great relief, without causing any unpleasant symptoms (Eberle). **Santonin**, in convulsions, epileptiform seizures, and affections regarded as choreic, etc., the result of reflex irritation from worms (Wa). **Phosphorus**, of occasional utility in affections of the nervous system induced by mental exertion or over-excitement; the danger from its use is its liability to produce fatty degeneration of the internal organs (Wa). **Sodium Phosphate**, hypodermically, employed with great benefit in a case of syringomyelitis, also in one of unilateral astasia-abasia: is considered by Luton to be possessed of reconstructive power equal to that of the animal extracts. **Orchitic Extract**, has been used with benefit in several affections of the nervous system [see page 162]. **Physostigma**, given for six months or longer, in small doses, gr. $\frac{1}{10}$ of the extract every 3 hours, is useful in many nervous affections, as locomotor ataxia, writer's cramp, and paraplegia due to myelitis (Murrell). **Silver Phosphate**, is of special value in sclerosis of the nervous substance and in myelitis (Wa). **Shower Baths**, cold, are often beneficial in nervous affections unconnected with disease of the brain. [Compare DIABETES, HEMICRANIA, HEADACHE NERVOUS, HEMIPLEGIA, HYSTERIA, INSOMNIA, LOCOMOTOR ATAXIA, MANIA, MELANCHOLIA, MYELITIS, NEURALGIA, NEURASTHENIA, NEURITIS, NERVOUSNESS, PARALYSIS, PARALYSIS AGITANS, SPINAL PARALYSIS, etc.]

Nervousness.

Opium, calms the nervous system and gives general repose to both body and mind (R); small doses, identity of drug to be carefully concealed lest the opium-habit be formed. **Antipyrin**, is efficient for nervous irritation. **Ignatia**, in small doses better than Morphine for mental excitement and nervous erethism (P); for the nervous exaltation of cinchonism (Pf). **Strychnine**, affords relief in functional irritability of the nervous system, manifested by restlessness and wandering neuralgic pains (B); especially useful as a tonic in nervousness from over-use of tobacco (H). **Potassium Bromide**, especially for women who are despondent, irritable, and sleepless, from overwork, grief, worry, etc.; often nected with migraine (R); gr. ss–j of any Bromide every ¼ hour, is very cient for the nervous disturbances of children (Smith). **Valerian**, extremely useful as a sedative to reflex excitability, calms nervousness, does much good in fevers where restlessness, fidgets, anxiety, etc. (P). **Aconite**, gtt. j of tinct. at bedtime, repeated if needful, for restlessness and "fidgets" of men as well as women (R). **Caffeine**, for restlessness due to great lowering of nervous power (P). **Chamomile**, lowers reflex excitability (P); minim doses of the tincture every 15 minutes an excellent sedative for children (Smith). **Resorcin**, produces quiet sleep in general nervous excitability. **Conium**, where a great deal of motor agitation, especially in the typhoid-like condition with insomnia, exaggerated nervousness and delirium, often resulting from mental overwork, acts charmingly in securing sleep, by removing the motor agitation; ♏x of a fluid extract of the unripe fruit, every ½ hour, carefully watched (Madigan). **Musk**, serviceable in nervous affections when due to uterine derangement (Wa). **Sumbul**, often invaluable in restlessness of pregnancy; ♏xxx–xl of tinct. with a little Chloric Ether as a draught (P). **Camphor**, a powerful subduer of reflex excitability (P). **Chloral**, where restlessness, debility (R). **Chloroform**, the Spirit internally (R). **Hop**, the hop-pillow is deserving of trial. **Lupulin** is peculiarly useful when Opium cannot be tolerated (Wa). **Water**, warm sponging to induce sleep and calm restlessness in convalescence; also, cold sponging (R). [Compare INSOMNIA, IRRITABILITY.]

℞. Strychninæ Sulphatis, . gr. j.
Quininæ Sulphatis, . . ʒj.
Tinct. Ferri Chloridi, . ʒv.
Ac. Phosphor. Dil.,
Syrupi Limonis, . . . aa ℥ij.
M. Sig.—A teasp. in water thrice daily.

℞. Potassii Bromidi, . . . ℥j.
Ext. Guaranæ Fl., . . . ℥jss.
Syr. Tolutani, ... ℥iij.
Aquæ, ... q. s. *ad* ℥vj.
M. Sig.—Teasp. to a dessertsp. three or four times daily. To relieve nervousness.

Neuralgia.

Antipyrin, is prescribed in all forms of neuralgia (M); is highly efficient in neuralgia of the 5th nerve associated with neuritis (B). **Acetanilid**, is used with success in facial and intercostal neuralgias (M); is highly useful against pain due to inflammation of nerves (B). **Phenacetin**, is especially useful in the fugacious and variable neuralgias so common in the hysterical and neurotaxic (M): of the three drugs named Phenacetin is probably the safest and most efficient in doses of 8–10 grains. **Salipyrin** has been employed with excellent results; a dose of gr. viij being often sufficient. **Phenocoll**, is used successfully, especially for the neuralgic pains of epidemic influenza (grippe). **Salol**, is very efficient in some forms. **Salicylates**, in large doses, cured a case of tic douloureux of 12 years' standing (Dercum). **Opium**, internally, or **Morphine** hypodermically, in the vicinity of the affected nerve, the best treatment; caution! morphine-habit (B); gr. $\frac{1}{16}$ to ¼ often relieves and frequently cures after a few repetitions (P); no remedy promises more speedy and permanent relief than Morphine by subcutaneous injection in sciatica, lumbago, tic douloureux and other neuralgic affections (Wa). **Aconite**, when arterial excitement (B); in congestive neuralgias, and acrodynic of extremities; has important rôle (P); as ointment or liniment, especially when fifth nerve affected; also in neuralgic headache (R); a remedy of great value (Wa); a perfect physiological remedy against neuralgia, especially those forms which are based on congestive or sub-inflammatory affections; but its action is often slow, so that Morphine must be given with it as a palliative. **Aconitine**, with Veratrine as an ointment locally, a good application (Da C); internally the best agent of all in essential neuralgia; should be combined with Quinine in intermittent forms and those which resist quinine alone. [See formula, p. 776.] **Belladonna**, must be persisted with in full doses; gr. $\frac{1}{80}$ of Atropine internally, or gr. $\frac{1}{50}$ to $\frac{1}{30}$ hypodermically in vicinity of nerve, has special utility in tic douloureux and sciatica; also in peri-uterine and dysmenorrheal neuralgias (B); ♏j of solution of gr. j in ʒij of water hypodermically (P); for spinal irritation, intercostal neuralgia; the

Liniment or Ointment of Atropine in facial (R); gr. ijss of the extract every hour till giddiness, then lessen the dose and continue for several days (Tr). **Veratrum Viride,** tincture, said to be very useful (R); Veratrine Ointment for facial neuralgia and sciatica (R); the Oint., gr. viij to ℥j, frequently of much benefit (P). **Quinine,** large doses, gr. v–xx in sherry, just before the attack in periodical neuralgia, whether malarial or not; useful also, in small, frequently repeated doses, in other types, especially of supra-orbital nerve (P); has selective action upon supra-orbital form (Spender). **Arsenic,** cures by its influence on bodily nutrition; directly so in neuralgia of malarial origin, though inferior to Quinine (B); in various neuralgias, also in angina pectoris (R); the Bromide of Gold and Arsenic rendered good service in an obstinate case of trifacial neuralgia diagnosed as due to syphilis, after other treatment besides anti-syphilitic had failed (E. A. Wood).

Nux Vomica, is most useful in visceral neuralgiæ, as gastralgia, hepatalgia, etc., the tincture with carminatives in the former affection; or Strychnine, gr. $\frac{1}{100}$ to $\frac{1}{32}$ twice or thrice daily: in all forms of neuralgia this remedy should be used in small doses (P). **Ignatia,** in hysterical and intercostal neuralgia with nervous erethism, is valuable (P). **Phosphorus,** gr. $\frac{1}{12}$ every few hours, has made very effective cures (B); gr. $\frac{1}{100}$ to $\frac{1}{12}$ every 3 hours; very useful in all forms, especially when uncomplicated (R); always a good remedy, except for cases due to cold or inflammation, and those not depending on depraved nutrition (H). **Ammoniated Copper,** in neuralgia of the 5th, used with remarkable success; ½-grain doses pushed (Féreol). **Physostigmine,** very efficient in neuralgia of the eyeball, a solution of gr. ij to the ℥ by instillation. **Cannabis Indica,** ¼–½ gr. doses of extract 2 or 3 times a day; especially for neuralgic headache (P); found useful (R). **Cod-liver Oil,** when low nutrition, faulty assimilation (W). **Iron,** when from anemia; tincture of the Chloride ♏xxx–xl ter die, also chalybeate waters (B); only moderate doses required (R); in chlorotic subjects, of whom nearly all will have neuralgia (Tr). **Iodides,** for neuralgia of fifth, dependent on syphiloma of the nervous system, pain, nocturnal chiefly (B). **Bromides,** benefit some kinds, especially ovarian (B); Potassium Bromide occasionally relieves (R). **Ammonium Chloride,** half-drachm doses in facial and other neuralgiæ, is much used (R); a very efficient and diffusible stimulant, gr. xx–ʒj at first, repeated every hour during the attack (H). **Chloroform,** as anesthetic to relieve pain, is occasionally useful locally, also as spray for uterine neuralgia (R); ♏v–xv of pure Chloroform by deep injection into vicinity of affected nerve, a very efficient method of dealing with long-standing cases (B); used in one case it caused symptoms so severe as to imperil the life of the patient (W). **Theine,** hypodermically, is promptly analgesic, and has prolonged influence, but must be aided by remedies to improve the nutritive state of the affected nerves, or agents which are capable of removing the diathesis upon which the neuralgiæ depend (Mays). [See formula, p. 776.] **Caffeine,** hypodermically has been found useful, especially in cervico-brachial neuralgia (P). **Cocaine,** as a hypodermic injection, a 4 or 5 per cent. solution is very effective if administered in the vicinity of the aching nerve (R); also by instillation in neuralgia of the eyeball, and whenever it can be applied to the mucous surface in the vicinity of the pain. **Croton Chloral,** very effective, especially in tic douloureux and sciatica, gr. ij–v every hour till gr. xv are taken (B); in facial, that from carious teeth, that of neck and back of the head, tic douloureux, etc. (R); gr. j every ½-hour is a very efficient dose (Smith); rarely of any value, but when used it is best given in 20-grain doses twice daily (H). **Chloral** and **Camphor,** equal parts, triturated together, and painted over surface (R); also with Morphine (B). **Amyl Nitrite,** inhaled in dysmenorrheal neuralgia (B); and when of 5th nerve (R). **Nitro-glycerin,** has often afforded great relief (Wa).

Sumbul, for certain types, of more value than any other remedy; facial, [illegible] ovarian neuralgias, in women of nervous constitution, often yield to [illegible] P). **Cimicifuga,** in neuralgia of the 5th from cold, and in ovarian [illegible] nium, successful in neuralgia of 5th (B); especially dental branches

(R); of value in trigeminal, ovarian, etc. (W); in suitable cases small doses answer as well if not better than large ones (Pf); ♏iij of the tincture every ½ hour often succeed miraculously with no ill results in neuralgiæ about the head and face (Smith); no better remedy in tic douloureux, but must be given in large doses, ♏x–xv of a strong tincture or fluid extract (H). **Zinc Valerianate,** extremely beneficial in neuralgia from reflex irritation of female pelvic organs (B). **Spigelia Anthelmia,** is useful in the facial form (P). **Ammonium Valerianate,** or **Zinc Valerianate** in neuralgia of face or head (R); the latter in nervous cases, and uterine (Wa). **Chamomile,** in neuralgia of the 5th nerve (R). **Staphisagria,** internally and externally often curative in obstinate facial and cervical neuralgia (P). **Ergot,** much employed in visceral forms, especially gastralgia (P); is said to be useful (R). **Digitalis,** is strongly recommended in sciatica, also locally in earache (P). **Valerian,** serviceable in facial neuralgia of hysterical type (P). **Bibiru Bark,** in intermittent forms (P). **Pyrethrum,** the root is chewed with benefit in facial neuralgia (P). **Capsicum,** a strong infusion on lint covered with gutta-percha (R). **Coccus Cacti,** has been very successful in 20–30 minim doses of a 1 to 8 tincture twice daily, the larger doses in the paroxysms (W). **Peppermint,** the Oil, painted over the part in facial neuralgia (R); especially the Chinese oil, which contains a large excess of **Menthol,** a very useful application in superficial neuralgiæ (W). **Turpentine,** has cured tic douloureux and sciatica (B); often of wonderful service (P). **Potassium Chlorate,** for facial neuralgia (B). **Alcohol,** containing much volatile ether; care must be taken in prescribing it (R). **Piscidia,** almost specific in many forms, useless in many cases (W). **Tonga,** is efficient in facial neuralgia, ♏x–xx every two hours (H). **Osmic Acid,** a one per cent. aqueous solution with glycerin to prevent change, of which 5 to 10 drops hypodermically, has made striking cures of inveterate neuralgiæ, with no ill effects resulting (Shapiro). **Carbonic Acid Gas,** injected into vagina for neuralgia of uterus. **Aquapuncture,** strangely relieves pain in a superficial nerve, so much so, that some hold the curative effects of morphine injections to be due to the water alone (B). **Counter-irritation,** Mustard poultices in neuralgic pains (P); blisters to a posterior branch of the spinal nerve-trunk from which the painful nerve issues (Anstie). **Wet Pack,** is of great benefit, especially in sciatica. **Intense Cold,** produced by a spray of Methyl Chloride, or concentrated Carbonic Acid gas, directed along the nerve from special apparatus, immediately relieves the pain, and usually cures (Jacoby). **Compressed Air,** by insufflation into the middle ear, in cases of persistent and paroxysmal temporo-occipital neuralgia, due to chronic follicular pharyngitis and inflammation of middle ear; if these insufflations result in diminution of the pain, treatment should be directed to the naso-pharynx and Eustachian tubes (Masucci). **Galvanism** of the affected nerve, one of the most important curative measures; a continuous current of 4 to 8 cells down the nerve generally answers best, though some cases are helped more by a rapidly interrupted faradic current: Electricity is of no value in cases dependent upon organic lesions, and in any individual case is purely experimental (W). **Diet,** animal fats necessary, as cod-liver oil, butter, cream, etc., in as large quantity as can be digested. **Rest** often needed, with protection from cold and damp, also flannel clothing, bathing and shampooing. [Compare GASTRALGIA, HEMICRANIA, HEPATALGIA, OTALGIA, OVARIAN NEURALGIA, SCIATICA, TIC DOULOUREUX, etc.]

For Internal Use.

℞. Quininæ Sulphatis,
Ferri Pyrophosphatis, āā ʒj.
Strychninæ Sulphat., . gr. ss.
Ac. Phosphor. Diluti, . ʒij.
Syr. Zingiberis, ... ℥ij.
Aquæ, ... q. s. *ad* ℥iv.
M. Sig.—A tablespoonful twice daily.

For Local Use.

℞. Aconitinæ (Duquesnel), gr. v.
Veratrinæ, ... gr. xv.
Glycerini, ... ʒij.
Cerati, ... ʒvj.
M. Sig.—To be rubbed over the part, carefully avoiding any abraded surface.
(*Da Costa.*)

For Internal Use.

℞. Phosphori, ... gr. ss–jss.
Alcoholis, q. s. *ad* solv.
Spt. Menthæ Piperitæ, . q. s.
Glycerini, . . . q. s. *ad* ℥ iv.
M. Sig.—A teasp. after each meal. (H.)

℞. Cupri Ammonio-sulphat., gr. j–iv.
Syr. Aurantii Flor., . . ʒj.
Aquæ Destil., ... ℥iij.
M. Sig.—One-third as a dose, thrice daily. (*Prof. Féreol.*)

℞. Aconitinæ Crystal., . . gr. $\frac{1}{30}$.
Quininæ Hydrobrom., . gr. xx.
M. ft. massa, et div. in pil. no. xij.
Sig.—One every 4 or 5 hours. (*Potter.*)

℞. Tinct. Aconiti,
Tinct. Colchici Sem.,
Tinct. Cimicifugæ,
Tinct. Belladonnæ, . āā part. æq.
M. Sig.—6 drops every hour until relieved. (*Metcalf.*)

For Local Use.

℞. Chloroformi,
Tinct. Aconiti, . . . āā ℥ss.
Linim. Saponis, ... ℥j.
M. Sig.—Apply on flannel and cover with oiled silk. For superficial neuralgia.

℞. Mentholi, ... gr. xlv.
Cocainæ Hydrochlor., . gr. xv.
Chloralis Hydratis, . . gr. x.
Vaselini, ... ʒv.
M. ft. ung. Sig.—For local use. (*Potter.*)

℞. Veratrinæ, ... gr. xl.
Adipis, *vel* Unguenti, . ℥j.
M. Sig.—Local use. (*Da Costa.*)

℞. Theinæ,
Sodii Benzoatis, . . . āā ʒj.
Sodii Chloridi, ... gr. x.
Aquæ Destil., ... ℥j.
M. Sig.—3 to 20 drops hypodermically at central seat of disturbance. ♏vj = gr. ss of Theine. (*Mays.*)

Neurasthenia.

Ammonia, the Aromatic Spirit has proved very serviceable; ℥ss–j in water thrice daily (Wa). **Hypophosphites** of Lime or Sodium, or Iron, are actively tonic in cases of nervous depression and torpor, with occasional shooting pains (Wa); the Syrup of the Hypophosphites with Strychnine is of service as a general tonic, in connection with other remedies. **Arsenic**, is often very serviceable; Fowler's or Pearson's solution, in doses of ♏iij–v, in water, after each meal. **Aurum**, the Bromide of Gold and Arsenic (Barclay), gave excellent results in 3 out of 4 cases of marked neurasthenia, in doses of ♏v of the solution 4 times daily (Love). **Strychnine Acetate**, a remedy of great promise, when combined with a rigid system of diet, mental discipline, etc. (Marshall Hall). **Zinc Oxide**, often excellent as a tonic and sedative, in nervous irritability and depression from anxiety, over-study, etc. (Wa). **Phosphorus**, of occasional utility in nervous breakdown from over-study, etc. (Wa). **Caffeine**, gr. j or more in a cup of coffee, to relieve brain weariness and nervous exhaustion (Wa). **Cocaine**, in ½-grain doses proves serviceable in nervous exhaustion (R): danger of cocaine-habit if identity known to the patient. **Coca**, as a stimulant has been used with benefit, but only for a short time, and acts deleteriously unless given in small doses (W). **Kola-nut** is used in France, contains Caffeine, is subject to the same remarks as Coca, above. **Musk**, is a valuable remedy in such cases, being stimulant and antispasmodic; it stimulates the nervous centres when exhausted, without producing any very pronounced symptoms (W). **Orchitic Extract**, has been used with benefit. **Nuclein**, is useful in many cases (Vaughn). **Cerebrinin**, has been used with advantage (Paul). **Artificial Serum**, in cases of lowered arterial tension (lessening of first sound, tachycardia embryocardia), an injection hypodermically of ♏xv of the solution formulated on next page, 2 to 4 times a day (*La France Méd.*). **Diet** should be chosen from the most readily assimilable food, calling for a minimum amount of digestive work. As a rule, neurasthenics [illegible] ch and drink too little; plenty of water, at least a liter and a half per day, is the best drink; it maintains the arterial tension, irrigates the tissues and assists the excretion of debris. Milk should be prohibited, also vegetable soups, peptones and extracts of meat. The albuminoid element of the food should not exceed one-fifth of the total (Vigoreaux). **Counterirritation**, the actual cautery along the spine has rendered excellent service in several cases of neurasthenia accompanied by neuralgia of the superficial branches of the spinal nerves; its action is doubtless often a mental one, and it renders the carrying out of the rest-cure more thorough than when attempted without something to enforce quiet. **Rest-cure**, with forced alimentation and systematic massage to keep up the muscles while holding the nervous system as inactive as possible, will do more than medicine in these cases. Many such will recover under the discipline and quiet of a hospital or sanitarium alone; while others are greatly benefited by removal from home influences and cares, and from association with certain persons who irritate them. [Compare ADYNAMIA, EXHAUSTION, GOUT, HYSTERIA, SPINAL IRRITATION.]

Artificial Serum.

℞. Sodii Phosphatis Pur., . . . ʒ iij.
Sodii Sulphatis Pur., ... gr. lxxx.
Sodii Chloridi Pur., ... gr. xxx.
Ac. Carbol. Cryst., ... gr. v.
Aq. Destil. Bullient., *ad* ℥ iv.
Dose, ♏xv hypodermically.

℞. Strychninæ Acetatis, ... gr. j.
Ac. Acetici Diluti, ... ♏xx.
Alcoholis, ... ʒ ij.
Aquæ Destill., ... ʒ vj.
Sig.—Ten drops thrice daily. (*Hall.*)

Tonic and Stimulant.

℞. Tinct. Kolæ, ... ℥ jss.
Ac. Citrici, ... gr. xx.
Sodii Arseniat., ... gr. j.
Tinct. Cocæ, . . . q. s. *ad* ℥ iv.
Dose, ʒ j at each meal.

℞. Ac. Phosphorici Dil., . . . ℥ j.
Elixir Calisayæ (U. S. Disp.), ℥ vj.
Elix. Ammonii Valerian., . . ℥ ij.
Glycerini, ... ℥ iij.
Vini Xerici, ... q. s. *ad* Oj.
M. Sig.—℥ j thrice daily.

Neuritis.

Strychnine, internally, is of value, and may be given in increasing doses (O); hypodermically, in multiple peripheral neuritis, is of great advantage; no case remembered in which it failed to cause improvement (Walker). **Acetanilid**, is so effective that it seems to have specific action (B). **Antipyrin** and **Salicylates**, are recommended in the acute cases with fever (O). **Arsenic** may be employed (O); the Bromide of Gold and Arsenic cured a case of neuritis with partial hemiplegia lasting five years, with inability to walk and considerable pain along the spine and in right arm and leg (Barclay). **Potassium Iodide** and **Mercury**, if there is a history of syphilis (O). **Massage** is probably the most reliable means at our command in the later stages, when the atrophy is marked and the pains have lessened. Contractures may be gradually overcome by passive movements and extension. The interrupted current is useful when the acute stage has passed (O). [Compare ALCOHOLISM, NEURALGIA, SPINAL IRRITATION.]

Nevus.

Ferrum Chloride, injected, is effectual; but dangerous when applied thus to nevi about the head (Wa). **Creosote**, pencilled over twice a day, may remove nevi (Wa). **Chromic Acid**, as escharotic, or local application, gr. c ad ℥j aquæ destil. (B). **Electrolysis**, or galvano-cautery, to remove nevi (B); 40 cases so treated; the process is certain and safe, leaving a faint cicatrix and no after-pain (Knott); in my hands has answered well during ten years' use in these cases (Marshall). **Nitric Acid**, strong, as escharotic for small superficial nevi, followed by Oleum Olivæ (B). **Zinc Chloride**, **Iodide** and **Nitrate**, locally, especially the first named (R). **Setons**, threads passed across the growth in various directions, to produce suppuration; when pus appears the threads should be removed. **Sodium Ethylate**, prepared by adding the metal Sodium, piece by piece, to absolute alcohol in a wide-mouthed bottle; the crystalline substance found deposited after effervescence ceases is an excellent caustic for nevi; painted over them it rapidly causes an eschar, and usually gives but little pain (Richardson). **Mercury**, the Acid Nitrate, an excellent caustic for removing moles from the face (Thomas).

Nightmare.

Potassium Bromide, in nightmare of adults, and children's attacks of night-screaming often associated with squinting: the digestive organs may also require attention (R). **Camphor-water**, a teaspoonful or two the most suitable medicine (H). **Sleep**, in abundance, may prevent nightmare (H). **Diet**, light; avoid late meals and indigestible food.

Nipples, Sore, Fissured.

Benzoin, an admirable local application (P); the tincture locally for slight erosions (Parvin). **Silver Nitrate**, touched lightly, is effectual (Wa). **Sulphurous Acid**, solution neat or diluted, constantly applied, or with equal quantity of glycerin as lotion (R). **Collodion**, sometimes used (R); useful for protection (P); better applications are Arnica cerate, the glycerite of Starch, or 2 parts of eau-de-Cologne to 1 of glycerin (R). **Lime-water**, is a useful application for cracked nipples. **Alcohol**, Brandy and water as a lotion before delivery and after each suckling to prevent cracking (R). **Borax**, saturated solution, beneficial (W). **Iron**, the solution of the Subsulphate diluted with 3 parts of glycerin, and applied with a camel's-hair brush, an effective application for fissured nipples (B). **Tannin**, the Glycerite, one of the best applications to fissured nipples (B). **Lead Nitrate**, in glycerin, or ointment ʒj to ℥j, for fissured nipples (B). **Zinc Shield**, constantly worn (R). **Balsam of Peru or Tolu**, valuable as an application, with Oil of Almond, gum arabic, and rose-water (P). **Rhatany**, as wash or cerate, has had great success in fissure (Tr); 1 part of extract to 15 of cacao-butter (Wa). **Nipple-shield**, to give the nipple rest while the child sucks, gives great comfort. [Compare LACTATION, MASTITIS.]

℞. Balsam. Peruvian., . . . ʒij.
Olei Amygdalæ, ... ʒjss.
Mucil. Acaciæ, ... ʒij.
Aquæ Rosæ, ... q. s.
M. Sig.—Apply to the nipples after each nursing. (*Phillips.*)

℞. Liq. Plumbi Subacet. Dil., ℥ss.
Ext. Opii, ... ʒj.
Aquæ Rosæ, ... ℥iijss.
M. Sig.—Lotion to be used after a bread-and-milk poultice, for inflamed nipples. (*F. Barker.*)

Nodes.

Mercury, the Oleate of Mercury and Morphine externally, is very valuable (R). **Potassium Iodide**, as ointment in conjunction with internal use, in syphilitic nodes of children; also in non-syphilitic periosteal thickenings (R): in syphilitic nodes it holds the first place, especially when pains are worse at night and increased by heat of bed (Wa). **Stramonium leaves**, locally, relieve (Wa). [Compare EXOSTOSIS, PERIOSTITIS.]

Nymphomania.

Potassium [illegible] when from plethora; not useful when relaxation, or from [illegible] large doses required, at least gr. xx ter die (R); an [illegible] stifies to its value (W). **Tobacco**, to nausea, effectually cures, but is horribly depressing (B). **Camphor,** in considerable doses said to control inordinate sexual desire (R); at present not much relied on (Wa). **Lupulin,** seems worthy of fair trial (Wa). **Sulphur,** or dilute Sulphuric Acid internally, when arising from hemorrhoidal congestion, not an infrequent cause (Wa). **Orchitic Extract,** has given satisfaction. **Cerebrinin,** has been used with benefit (Paul).

Obesity.

Iodoform is highly efficient, but causes wasting and anemia, the latter by injuring the red blood corpuscles (B). **Iodol,** in 2-grain doses thrice daily, is equally effective (B). **Alkalies,** as solutions of Oxides or Bicarbonates (R); alkaline mineral waters, with exercise and dietary (B); serviceable (Wa); Liquor Potassæ ʒss in milk, thrice daily, of established value (Wa); generally fails (R). **Ammonium Bromide,** sets up gastric catarrh (B); but lessens corpulency (Wa). **Sulphurous Waters,** especially Blue Lick, ℥iv before each meal (B). **Potassium Permanganate,** for attendant dyspepsia and flatulence; also useful for the obesity; gr. ¼–j ter die, in distilled water (B). **Vinegar,** only successful at expense of serious injury to the body (R). **Fucus Vesiculosus,** has power to reduce adipose tissue; an extract is sold under the title *Antifat* as a proprietary medicine (W). **Phytolacca,** has been long known as a reducer of adipose tissue; a resinoid preparation, named **Phytoline,** is on the market as an "anti-fat," the dose of which is ♏x, six times daily, before and after each meal. **Thyroid Extract,** has been employed in several cases with uniformly good results [see page 159].

Banting Dietary is alone sufficient to improve the condition; its chief feature is the exclusion of the two elements, starch and sugar, from the food; therefore bread (except toast, or the crust of a common loaf), potatoes, sweet roots, butter, sugar, cream, beer, porter, and champagne, should be avoided. In one year, on this diet, Mr. Banting reduced his weight 46 pounds, and his girth about 12 inches; at the same time, his numerous corporeal infirmities were greatly mitigated or altogether removed; but it cannot be recommended indiscriminately. This was the method of Hippocrates, avoiding all fats, starches, and sugars; in fact, all roots or vegetables which grow underground (B). **Meat Diet,** very successful in 42 cases, the diet being confined to rump-steak, hot water and codfish, for 14 days, absolutely excluding everything else (Smith). The **Schweninger** or **Oertel** method is similar, using chiefly albuminous food, excluding fat and carbohydrates, limiting the fluids drank, especially at meals, and enforcing exercise. **Peanuts,** are an excellent article of food for the corpulent (Furbringer). [See under DIABETES MELLITUS.] **Exercise,** daily, in the open air, is necessary, and if carried on systematically is the most efficient and least injurious method of reducing an excess of adipose tissue.

Odontalgia.

Aconite, as ointment or liniment for facial neuralgia due to diseased teeth, will succeed quickly if at all (R, Wa). **Arsenic,** gr. $\frac{1}{20}$, as escharotic to destroy pulp; when used for pain may be mixed with Opium; it sometimes at first aggravates pain (R, W). **Staphisagria,** the alcoholic solution dropped into the cavity (P). **Alum,** a solution in Nitric Ether, ʒij to ʒvij, is said to be an effectual application (B); Alum and salt powdered and placed in the cavity, excellent when nerve exposed. **Chloral,** rubbed up with an equal weight of Camphor, and placed in the cavity (R); these two, with Glycerin and Carbolic Acid, equal parts of each ingredient, applied on a little cotton after cleaning the cavity, will relieve the pain, and makes an excellent mixture for "toothache drops" (Brodnax). **Chloroform** or **Croton-Chloral,** equal parts of the former and Creosote, a good application (R). **Tannin,** a solution in Ether is a good application to a carious tooth (B). **Creosote,** with Tannin or Opium or Chloroform, placed in the cavity of a decayed tooth, often gives relief (R). **Sodium Salicylate**, gr. xv every 4 hours, is highly efficient for toothache started by taking cold, also for the periostitis in which the tooth becomes loosened and projects so as to be exquisitely tender when eating (Coley). **Cocaine**, a 5 per cent. solution on cotton applied to a cavity will often bring instant relief. **Coniine**, a solution in alcohol placed into a hollow painful tooth (R). **Collodion** and **Carbolic Acid**, equal parts, as jelly for filling carious teeth (R). **Opium**, mixed with Tannin or Creosote inserted in cavity of painful tooth (R). **Morphine**, hypodermically for severe toothache (R). **Oil of Cloves**, inserted into cavity (P). **Camphor**, with Morphine and Flaxseed, as a cataplasm to the cheek (B). **Xanthoxylum**, a domestic remedy (B). **Capsicum**, a strong infusion on lint (R). **Gelsemium**, useful in some forms (R). **Zinc Chloride**, to destroy exposed painful pulp (R). **Ginger, Mezereon, Pyrethrum**, are useful masticatories in toothache (P). [Compare GUMS]

℞. Linim. Aconiti (B. P.),
Chloroformi, ... āā ʒ iij.
Tinct. Capsici, ... ʒ j.
Tinct. Pyrethri,
Olei Caryophylli,
Pulv. Camphoræ, . . āā ʒ ss.
M. Sig.—A few drops to be placed on a pellet of cotton and applied to the cavity. (*Mason.*)

℞. Acidi Tannici, ... gr. xx.
Mastiches, ... gr. x.
Ætheris, ... ℥ ss.
M. Sig.—On cotton to cavity. (D.)

℞. Creosoti, ... ʒ ij.
Ol. Caryophylli, . . . ℥ iv.
Ol. Menth. Piperit., . . ℥ j.
Camphoræ, ... ℥ ijss.
Alcoholis . . . q. s. *ad* Oj.
M. Sig.—Toothache Drops.

℞. Morphinæ Sulph., . . . gr. iv.
Atropinæ Sulph., . . . gr. j.
Aquæ Destill., ... ℥ j.
M. Sig.—A few drops on cotton, placed in the cavity. (B.)

Onychia and Paronychia.

Silver Nitrate, a strong solution in Nitrous Ether, painted over the adjacent tissue, will abort if applied early (B); frequently causes resolution of the inflammation (Wa). **Lead Nitrate**, dusted over night and morning (R); relieves pain and hastens healing process (B). **Turpentine**, applied on a piece of lint or other absorbent material, stops the pain at once, and seems to abort the felon. **Mercury**, as ointment, for 10 minutes in every hour; poultices in interim (R). **Arsenic**, gr. ij ad ℥j Adipis, as ointment, almost specific in onychia maligna (Wa). **Tartar Emetic**, will shorten course and render it milder (R). **Iodoform**, oint. or powder dusted on (B); or 1 part to 9 of Ether applied by a dropper, in syphilitic onychia (Fox). **Iodine**, a strong alcoholic solution locally will often subdue the disorder (Wa). **Chloral**, a solution locally, as antiseptic and to promote healing (B). **Sodium Chloride**, common salt roasted until the chlorine is driven off, equal parts of this, Castile Soap and Venice Turpentine, as a poultice, is a very efficient application. **Carbolic Acid**, to benumb surface during incision (R); which should be carried down to the bone, especially in tendinous whitlow (D). **Cocaine**, hypodermically, will accomplish the local anesthesia more thoroughly, if delivered deeply into the tissue. **Morphine**, powdered, as local application to relieve pain. **Heat**, by poultices, is a very beneficial application. **In Opening** a felon avoid the lines of the arteries on the sides of the fingers, and that of the flexor tendons, which is the median line on the palmar surface; the incision should be made midway between these lines. If the sheath of the tendon be opened the tendon may slough, and the finger be rendered useless (Ashhurst). **Removal** of the nail may be necessary in obstir [illegible] of onychia, the raw matrix being dressed with powdered Lead

Ophthalmia.

Silver Nitrate, a strong solution, gr. xx to the ℥, in granular lids; cautiously when corneal ulcers exist (B); a solution, gr. ij–x to the ℥, painted over the everted lids, which should be washed with a solution of common salt, and then with water before being replaced (C); in solution, gr. v to ℥j aquæ destillatæ, locally once a day in purulent ophthalmia of the new-born, washed off with a weak solution of common salt (Noyes); in solution, gr. iij to the ℥, to abort the discharge in catarrhal ophthalmia (Fox). **Boroglyceride**, in many catarrhal affections, especially ophthalmia neonatorum, is a most efficacious application, the solutions used being of 10, 25 and 50 per cent. strength (Fox). **Alum**, gr. viij to ℥j aquæ, applied every ¼ to ½ hour in purulent ophthalmia of children; success depends on the frequency of the application (R); a crayon formed of a crystal of alum, a mild and occasionally useful application (C). **Mercury**, Calomel dusted over membrane in phlyctenular ophthalmia; or after detaching scales rub in Brown Citrine Ointment every night, for eczema of margin of lids (B). **Pulsatilla**, as a lotion to conjunctiva 8 or 10 times in 24 hours, also internally (P); much used by homeopaths (B). **Spigelia**, useful in rheumatic ophthalmia (P). **Antimony**, as Tartar Emetic, gr. $\frac{1}{48}$ to $\frac{1}{36}$, three or four times a day in strumous ophthalmia, with sharp purgation at commencement (R). **Belladonna** or **Atropine** locally, of great service in strumous ophthalmia to relieve pain; constitutional treatment also required (Wa); Atropine, gr. ij of the neutral sulphate to the ℥ of aqua destillata, twice or thrice daily, as soothing application (C). **Arsenic**, invaluable in inveterate cases of strumous ophthalmia, especially when complicated with cutaneous eruptions (Wa). **Copper Sulphate**, gr. j to ℥j aquæ camphoræ as collyrium in purulent ophthalmia of infants; in substance to inner part of lids in granular conjunctivitis (Wa). **Tannin**, powdered or in solution, gr. j–x to the ℥, produces remarkable results (B). **Lead Acetate**, gr. j ad ℥j aquæ destillatæ, applied by camel's-hair pencil to surfaces of everted lids, washed away before the lid is replaced; or the Tannate of Lead 1½ to 3 parts fine Oil and 1 of fresh Lard, a very small piece as ointment to lid (C). **Carbonic Acid Gas**, said to relieve the pain and photophobia of strumous ophthalmia, when locally used (R). **Physostigmine**, locally, to reduce pupil and shut out the light (P). **Iodine**, is employed locally in scrofulous ophthalmia for its alterative stimulation (W). **Iodoform**, in gonorrheal ophthalmia, and purulent conjunctivitis, of very great value locally, but should be pulverized very finely (Grossmann); does not bear out the claims made for it (Keyser). **Zinc Chloride**, gr. j ad ℥j aquæ, as collyrium in gonorrheal ophthalmia is used with marked benefit; also a stronger solution, gr. ij–iv to the ℥, effectually arrests the muco-purulent discharge remaining after subsidence of purulent ophthalmia, and has succeeded admirably in diphtheritic conjunctivitis and pustular ophthalmia (Wa). **Zinc Sulphate**, as collyrium, gr. j–iv to the ℥, is very serviceable in ophthalmia of infants or adults; Liquor Plumbi added improves it (Wa). **Staphisagria**, especially in tarsal ophthalmia (P). **Colchicum**, when gouty diathesis (P). **Cod-liver Oil**, in strumous subjects, tends to remove the manifestations of the disease (R). **Cold Wet Compresses**, or iced, are held to be essential in the early stage of acute purulent and gonorrheal ophthalmia (C). [Compare BLEPHARITIS, CONJUNCTIVITIS, KERATITIS.]

Opium Habit.

Sodium Bromide, in large and increasing doses, ʒj twice daily, increased by 20 grains each day, to a maximum of 100 to 120 grains twice in twenty-four hours, with simultaneous gradual reduction of the opiate dose, so that from the 8th to the 10th day it is entirely abandoned; each dose of the salt should be given in 6 or 8 fluid ounces of cold water; this drug, with Codeine and Trional, form a combination of unrivalled efficacy, if properly used in proper cases, and combined with minor aids make a method far in advance of any yet presented, to secure the minimum duration of treatment and maximum freedom from pain (Mattison): a combination of Bromides [formula on next page], commencing with 40 grains, increasing to 100 grains twice daily, at 10 A.M. and 4 P.M., freely diluted with water, does not depress vitality, or produce the injurious results of the bromides as commonly administered; this, with ʒj of Warburg's Tincture before breakfast each morning, Spt. Ætheris Nitrosi to eliminate the bromides rapidly, electricity, a mixture of Iron and Strychnine, and an occasional hypodermic of 5 or 10 minims of a 4 per cent. solution of Cocaine for nervous restlessness, is the general line of my treatment (Mann): by acute bromidism it is possible to obliterate quickly and permanently the desire for morphine without the usual suffering, but requires careful nursing (Macleod). Bromides may do great harm, if recklessly administered, paralyzing the muscular system and causing prolonged delirium. **Cocaine**, or the fluid extract of Coca, has been used to relieve the depression caused by the withdrawal of the drug (B); has been, by many careful observers, pronounced of great benefit, restoring appetite, inducing sleep, promoting digestion, while soothing the brain and inducing a feeling of contentment and calm (R): should never be entrusted to the patient, lest he jump out of the frying-pan into the fire. In the treatment of the combined morphine and cocaine habit, the latter drug may be withdrawn entirely at once without any suffering, and the former may be reduced one-half at the same time. **Codeine**, in doses of a grain or more, is very useful in combating the nervous agitation which succeeds to the final withdrawal of the opium. [See under SODIUM BROMIDE above.] **Trional**, in dose of 30 to 40 grains as a hypnotic, is of special value in these cases. **Paraldehyde**, in dose of ʒjss–ij, as a hypnotic, is efficient, but its sleep is of briefer duration than that produced by Trional or Sulphonal. **Gelsemium**, subdues the restlessness and motor excitement; proved of great value in one case where 30 grains of morphine were used daily; ♏j of tincture every $\frac{1}{2}$ hour (Pennoyer). **Conium**, in 10-drop doses of a good fluid extract, to check motor activity and relieve the wandering pains. **Sparteine**, in doses of gr. $\frac{1}{3}$ to $\frac{2}{3}$ hypodermically, at moment of systolic cardiac depression which answers to the period of craving, and corresponds to the truncated curve of the sphygmographic trace, characteristic of the period when the stimulant effect of morphine has passed (Jennings). **Nitroglycerin** acts in the same manner, but its effect is more rapid and ephemeral (Id). **Atropine**, used with great benefit in one severe case, repressing the copious exudation from the air-passages, bowels and skin, and moderating the distressing symptoms due to the withdrawal of the morphine (W. Koch). **Physostigmine**, gr. $\frac{1}{100}$ acts remarkably well at the crisis as a substitute for the drug. **Duboisine**, injected daily succeeded in destroying the craving for morphine in a case of long standing (Birnabee); is an excellent calmative and hypnotic at the crisis. **Hyoscyamine**, Merck's amorphous, useful as a hypnotic, and is perfectly safe in patients of good general condition, in whom the disuse of opium produces unusual insomnia and motor activity (M). **Hyoscine**, the Hydrobromate, in doses of gr. $\frac{1}{100}$ to $\frac{1}{60}$, hypodermically, is very efficient for the same purpose, but must be used sparingly, as it excites high delirium in most subjects for a time. **Cannabis Indica**, may be required in full doses, for restlessness after withdrawal of the opiate, ʒ-doses of Squibb's fluid extract, repeated every hour or two, as required (M); or increasing doses of Hering's solid extract, beginning with one or two grains. **Chloral**, as a hypnotic, fails in the first few days of abstinence; later in full doses, 45 grains at once, rather than three 15-grain doses, alone or with a Bromide, it can be relied on (M). **Galvanism**, is very efficient for the neuralgic pains in various parts; a strong faradic current sometimes acting better (M). **Baths**, if hot, 105° to 112° F., are of great value to relieve disquiet; warm baths are worthless (M). **Lavage** of the stomach with a solution of Sodium Bicarbonate, or the drinking of such a solution to neutralize the hyperacidity of the stomach, which is [illegible] of most of the distress (Erlenmeyer).

[illegible] e, is invaluable, especially when the cure is nearly completed (Barr).

Aurum, the Bromide of Gold and Arsenic, ♏x hypodermically, as a tonic, thrice daily, to complete the cure. **Capsicum**, is serviceable as a stimulant to the stomach and a cerebral sedative; removes the sinking sensation at the epigastrium, and tones up the intestines. **Catechu**, the tincture in ʒ doses, for the diarrhea. **Ergot**, in full doses, for the headache. **Lupulin**, with Phosphoric Acid [see formula below], helps to sustain the patient, lessens the force of his suffering, and shortens its duration (Fleming). **Zinc and Iron**, as blood tonics, administered for a month at least, are valuable restoratives, and are best given on alternate days (Fleming). **Piscidia Erythrina**, has been proposed as a substitute, and highly recommended, but is worthless, as are also **Avena Sativa** and many other falsely termed substitutes (M); there is no specific for the opium habit (Da C). **Zinc Oxide**, for the vomiting and diarrhea, beginning with gr. j once daily and increasing to tolerance (Da C). **Withdrawal** of the drug suddenly and completely, is the method of Levinstein and other Germans, and is preferred when we can have absolute control and surveillance of the patient (Da C); entails horrible suffering, and is utterly inexcusable (M); a more gradual reduction is the method usually employed, taking off one-third the first day, one-fourth the second day, and then gradually reducing the amount until the sixth or seventh day, when it may be withdrawn entirely. No agent is of any value unless strengthened by moral courage and perseverance on the part of the patient (Squibb). Useless to try to cure a patient while he is pursuing his ordinary avocations; failure will result unless there is complete seclusion and entire giving up to the treatment (Mann). It is very important to keep the patient in total ignorance of the rate of reduction.

℞. Ammonii Bromidi,
Sodii Bromidi, ... āā ℥ss.
Potassii Bromidi, ... ʒj.
Liq. Potass. Arsenit., . . ʒj.
Syr. Tolutan., ... ℥j.
Aquæ Menthæ Piper., . . ℥jss.
Syr. Hypophos. Comp., . ℥iij.

M. Sig.—ʒj to ʒij in water thrice daily. Has of total Bromides, gr. 21⅓ in each ʒ. (*Mann.*)

℞. Tinct. Capsici,
Potassii Bromidi, . . . āā ʒiv.
Spt. Ammoniæ Aromat., . ℥iij.
Aquæ Camphoræ, . q. s. *ad* ℥vj.

M. Sig.—A dessertsp. several times daily, in the depression of alcoholism and the opium-habit. Instead of the bromide, Fowler's solution, ♏l, may be added; or Tinct. Nucis Vomicæ ʒij, or Tinct. Aurantii Amari ʒv. (*Ringer.*)

℞. Codeinæ, ... gr. xvj.
Alcoholis, ... q. s. *ad* solv.
Cocainæ Hydrochlor., . . gr. xvj.
Elixir Simplicis, . q. s. *ad* ℥ij.

M. Sig.—ʒj in water, occasionally, when great restlessness. Formula never to be given to the patient. (*Potter.*)

℞. Tinct. Cannabis Ind., . . ♏xl–lx.
Spt. Ætheris, ... ʒj.
Aquæ, . . q. s. *ad* ℥j.

M. Sig.—One dose, if insomnia is very protracted. (*Fleming.*)

℞. Tinct. Nucis Vomicæ, . . ʒiij.
Ac. Phosphor. Diluti, . . ʒv.
Syr. Pruni Virg., ... ℥ij.
Aque, . . . q. s. *ad* ℥iv.

M. Sig.—ʒij twice daily as a nerve tonic. (*Potter.*)

Orchitis.

Pulsatilla, ♏j or less of the tincture every hour, relieves the pain rapidly, though not the edema (St). **Belladonna**, int., and as oint.; extract j ad iij Adipis, when inflammation has subsided (Wa). **Sodium Salicylate**, in gonorrheal orchitis, subdues the pain in a few hours. **Iodine**, tinct. locally to remove swelling after the acute stage has passed (B). **Iodoform**, 1 part in 10 of vaselin, as ointment to reduce enlargement, a very efficient application. **Mercury**, the Oleate locally (B); Calomel gr. iij with Ipecac gr. x, at once, followed by a saline next morning, and smaller doses of Calomel and Ipecac every 6 hours, with Morphine gr. ¼ hypodermically into cellular tissue of scrotum (McElroy). **Ammonium Chloride**, makes a good evaporating lotion in solution with alcohol and water (R). **Silver Nitrate**, a strong solution to the scrotum, with gentle pressure (Wa). **Tartar Emetic**, in acute orchitis (R). **Digitalis**, locally, is found most useful (P). **Guaiacol**, pure, as a local application for the pain. **Alcohol**, with equal quantity of water, as evaporating lotion (B). **Ice**, benefits the inflammation and relieves pain (B). [Compare EPIDIDYMITIS.]

℞. Ammonii Chloridi, ... gr. xl.
Alcoholis, Aquæ, . . . āā ℥ij.
M. Sig.—Lotion, to be applied on thin cloths to the part.

℞. Hydrarg. Ammoniat., . . ʒj.
Cerati Simplicis, ... ℥j.
M. ft. unguent. Sig.—Apply locally, with gentle friction.

Otalgia.

Aconite and **Opium**, equal parts of the tinctures, a few drops well down the external meatus, will usually subdue the pain. **Blistering Fluid**, or Croton Oil Liniment behind the ear, often relieves earache (R). **Glycerin**, for dryness of meatus (R); or Olive Oil for accumulation of wax in external meatus, dropped in every night, gentle syringing in the morning with warm water (Cl). **Opium**, Morphine in solution, gr. iv to the ℥, with gr. j–ij of Atropine, is an excellent application (B). **Atropine**, gr. $\frac{1}{60}$ in ʒxx of water, a teasp. every three hours for a child in the acute otitis media of children from coryza, very successfully used to abort the otitis and relieve the earache (Miot); a solution locally is especially applicable in the earache of children from whatever cause, gr. j to the ℥, of which gtt. iv dropped into ear to remain for 10 or 15 minutes. **Pulsatilla**, internally and externally, is often used with advantage (P). **Cocaine**, a 4 per cent. solution sprayed over the tympanic membrane through the external meatus, and forced into the Eustachian tubes by inhaling the spray and then expanding the tubes by Valsalva's method; this repeated every three minutes is a very sure method of curing otalgia (R). **Olive Oil**, often used warm as a local application, but it is of no service and may do harm by undergoing decomposition and becoming favorable soil for the growth of aspergillus or other vegetable fungi. [Compare OTITIS.]

℞. Chloralis Hydratis,
Camphoræ,
Acidi Carbolici, ... āā gr. xx.
Olei Ricini, ... ℥j.
Sig.—Pour into the ear (after warming) enough to fill it; cover with cotton wet with warm water, and a cloth wrung out of hot water. (*Bradnax.*)

Otitis.

Pulsatilla, in inflammation of external auditory canal; in otitis, as lotion warmed and applied by syringe, three or four times a day (P). **Aconite**, quickly relieves the pain (R); should be used internally and locally. **Carbolic Acid**, a 20 per cent. solution instilled into ear in moderate otitis, relieves the pain at once and checks progress; a solution in glycerin is best (Rohrer). **Atropine**, in the acute otitis media of children, is very efficient. [See OTALGIA, above.] **Blisters**, behind ears, either kept discharging or repeated, are often very useful (Wa). **Leeches**, behind the ear, afterwards a small blister upon the same place, when the leech-bites have healed (H). **Warm Douche** frequently to the ear, to secure cleanliness, then dry the part thoroughly (Roosa). [Compare OTALGIA.]

Otorrhea.

Salol and **Camphor**, equal parts, heated together, have given good results in suppuration of the middle ear; the application causes neither pain nor inflammation (Pégon). **Bismuth Subgallate**, on cotton tampon, introduced after thorough syringing with a 3 per cent. solution of **Boric Acid**, and careful drying with absorbent cotton, the best means of combating an acute or chronic otorrhea, outside surgical measures (Chaniavsky). **Boric Acid**, finely pulverized, as astringent and disinfectant application; may be mixed with pulv. Alum, and just enough powdered Lycopodium to keep it dry; this packed carefully through speculum, after washing with a weak and tepid alkaline solution. **Absorbent Cotton**, on holder, may be used every few hours by the patient to keep pus removed from the canal. **Syringing** with warm salt water, once daily, as absolute cleanliness is essential in the treatment. **Politzer Bag**, inflation is a useful adjunct in keeping secretions out of tympanum and breaking up adhesions (Roosa). **Mercury**, in chronic cases, the Brown Citrine Ointment (B). **Lead** lotions are much employed (B). [See GONORRHEA, for formula.] **Potassium Permanganate**, as injection or spray, gr. j to ℥j aq. destil. (B). **Silver Nitrate**, locally, a solution of gr. iv to the ℥ (B); gr. x to the ℥ (Roosa). **Copper Sulphate**, gr. j–v to the ℥ (Roosa). **Tannin**, the Glycerite, locally, is successful (B); especially in children (Wa). **Zinc Sulphate**, locally, in solutions of gr. ij–viij to the ℥ (B); gr. j–v to the ℥ (Roosa). **Cadmium**, gr. ij to ℥j rose-water (B). **Liquor Sodæ Chloratæ**, ♏xv–xxx ad ℥j aquæ when discharge fetid; is highly useful as injection (Wa). **Quinine**, with Sulphuric Acid, advisable in otorrhea after scarlatina (Wa). [Compare OTITIS.]

Ovarian Neuralgia.

Codeine, has especial value against ovarian pain (Freund), whether of inflammatory or neuralgic origin, in doses of gr. ¾ at least. **Opium**, often the cause; if use stopped entirely improvement may ensue (E); one of the best remedies in ovarian pain of non-inflammatory character (Graily Hewitt). **Atropine**, subcutaneously, the best remedy for pain in the pelvic viscera (Wa). **Ammonium Chloride**, gr. xxx with gtt. ij–v Tinct. Aconiti, repeated in ½-hour if necessary, to relieve pain (W). **Camphor**, with Cannabis Indica, of great service in relieving ovarian pain, especially when spasmodic in character (W). **Conium**, or, better still, its alkaloid, used as a vaginal pessary, in all cases of ovarian pain, whether neuralgic or inflammatory, is quite a specific (Meadows). **Ether**, the compound spirit, in doses of ♏xxx–xl as a palliative (Anstie). **Gelsemium**, deserves a trial; its power is great but not certain (Wa). **Hot Water**, as vaginal injections night and morning; sunlight baths, fresh air (E). **Leeches** over the groin, or inside the thigh, when ovarian pain persistent, or tenderness and aching (Wa). **Surgical**, Battey's operation as a last resort (E). [Compare DYSMENORRHEA, OVARITIS.]

Ovaritis.

Tartar Emetic, as ointment for counter-irritation over seat of disease, in subacute ovaritis; at the same time a pill of Opium, Hemp and Camphor (Hewitt). [Formula on next page.] **Opium**, in suppository or enema, more effectual than internally (Tilt). **Mercurial Ointment**, combined with Camphor and Belladonna, over the seat of the disease by friction (West). **Blisters**, in subacute ovaritis are often of great service, placed over the region or to the cervix uteri (Wa). **Enemata**, of warm water, simple or medicated, in subacute ovaritis, are warmly recommended; they should be retained as long as possible (Wa). **Salix Nigra**, the "pussy willow," in doses of ♏xxx of the fluid extract thrice daily, of decided benefit in ovarian hyperesthesia, etc., of highly nervous women. **Ergot**, is valuable in chronic ovaritis, with rest and Potassium Bromide (Tait). **Aurum** salts, have been found beneficial in dropsy of the ovaries (Martini). **Ovarian Extract**, has been used in ovarian disease [see page 166]. **Parotid Extract**, used as an internal remedy in six cases of enlarged and tender ovary with menorrhagia, etc., with signal success (Bell). **Turpentine**, hot turpentine epithems applied over the seat of the disease (Wa). **Ice**, in bag, over seat of pain, when intolerable, and patient too much reduced to bear leeches; is often of benefit (Wa). **Poultices of Linseed meal**, as light as possible, often produce great benefit in ovarian inflammation.

℞. Ext. Opii, ... gr. iij.
Ext. Cannabis Ind.,
Camphoræ, ... āā gr. vj.
M. ft. pil. no. vj. Sig.—One pill twice daily. (*Graily Hewitt.*)

℞. Ung. Hydrargyri, ... ℥vj.
Camphoræ, ... gr. xl.
Ext. Belladonnæ, ... ℥ij.
M. ft. unguent. Sig.—To be rubbed in twice daily. (*West.*)

Oxaluria.

Mineral Acids, when eructations of sulphuretted hydrogen (R). **Nitro-muriatic Acid**, renders important service (B); especially in the condition showing general malaise, weakness, and depression of spirits, with oxalate crystals in the urine (W); also in sciatica and other forms of neuralgic rheumatism accompanied with oxaluria, full doses, ♏vj–x, of this acid, with an occasional brisk purgative, and cold douche followed by friction (Wa). **Zinc Sulphate**, often very serviceable in irritability of the nervous system, associated with dyspepsia and oxaluria (Bird). **Lactic Acid**, aids imperfect digestion (B). [Compare DYSPEPSIA.]

Ozena.

Aurum Salts, are very serviceable in syphilitic ozena (B). **Mercury**, the Ointment of the Nitrate in syphilitic form; the White or Red Precipitate with 58 times its weight of sugar, snuffed after clearing the nose, in non-syphilitic forms (R). **Potassium Permanganate**, solution ʒj to Oj as an injection or spray (B). **Hydrastis**, the fluid extract locally (B); solution ʒj to ℥viij as lotion with ♏v of the tincture internally thrice daily (P). **Bromine**, as inhalation [see formula below]; or **Iodine** with **Carbolic Acid**, or the latter in one per cent. solution, as inhalations (B). **Carbolic Acid**, a 1 per cent. solution inhaled from atomizer (B). **Silver Nitrate**, applied behind veil of palate; gr. v–xx ad ℥j (B). **Alum**, solution, ʒj to Oj, for irrigation (R). **Glycerite of Tannin**, by irrigation (R). **Salicylic Acid**, in very weak solution, 1 to 500, as cleansing, astringent, and disinfectant wash, used by retro-pharyngeal syringe, and followed by applications of **Calomel**, in powder, to the ulcerated portions of the mucous membrane (Massei). **Hydrogen Dioxide**, the solution as spray, is a most excellent application. **Salol**, has done good service, as insufflation. **Strontium Iodide**, has been used in scrofulous ozena, with varied results. **Cubeb**, the Oleo-resin, gtt. xv–xx on sugar after each meal, to restrain the secretion and perhaps modify its character (Cohen). **Calcium Chloride**, gr. xxx–lx with ℥j Decocti Krameriæ; of which ʒij–iij, diluted with an equal quantity of water, should be injected twice daily after cleansing with salt and water (Cohen). [Compare CATARRH, CHRONIC NASAL.]

℞. Tinct. Iodi, ... ʒiv.
Acidi Carbolici, ... ʒj–ij.
M. Sig.—Use on sponge in a wide-mouthed bottle as inhalation. To be vaporized by heat of hand. (*Potter.*)

℞. Bromi, ... ʒss.
Alcoholis, ... ℥ss.
Sig.—Use by inhalation when vaporized by heat of the hand.

℞. Sodii Carbonatis,
Sodii Boratis, ... āā ʒij.
Liq. Sodæ Chloratæ, . . ℥ss–ʒij.
Glycerini, ... ʒj.
Aquæ, ... q. s. *ad* ℥vj.
M. Sig.—Apply by means of a hand-spray apparatus. (*Thornton.*)

℞. Acidi Carbolici, ... ♏xx.
Aquæ Calcis, ... Oj.
M. Sig.—Use as wash or spray.

Pain.

Opium, is the most efficient of all analgesics and is universally used to relieve pain [see page 406]; the Liniment applied with friction relieves pleurodynia, superficial neuralgia, etc., and poultices containing the Tincture are useful applications in the pain of inflammation. Opiates soon lose their power in any particular dose, and require increasing dosage to sustain their analgesic influence, hence in chronic cases all other means should be exhausted before resorting to them (R). **Morphine**, is the most analgesic alkaloid of opium; hypodermically in the vicinity of the nerve is curative when not so by the stomach (B); the Sulphate, gr. ⅙ to ½ with Atropine Sulphate gr. $\frac{1}{120}$ to $\frac{1}{100}$, is very efficient, but the morphine-habit must be kept in mind; a single injection thereof is sometimes curative in sciatica and other neuralgiæ; the conjoined administration of Morphine and Antipyrin is much more efficient in pain than the use of either agent alone. **Codeine**, has a special influence over abdominal pain and that of the ovaries, and is not liable to give rise to a drug habit. **Antipyrin**, is a most efficient analgesic in doses of 10 to 15 grains, being especially adapted to neuralgia, migraine and the pains of gouty and rheumatic origin, but is of no value in pain due to a local inflammation; it may be used hypodermically. [See under Morphine, above; also page 172.] **Acetanilid**, is highly efficient in doses of 4 to 7 grains for the pains of locomotor ataxia and those of rheumatic origin; also locally as a dry dressing for painful wounds, ulcers, etc.; it is the active ingredient in a host of recent proprietary remedies against pain [see page 77]. **Phenacetin**, is efficient in 10 to 15 grain doses, for neuralgia, hemicrania, etc. **Phenocoll Hydrochloride**, in doses of 12 to 15 grains, is a good analgesic in the neuralgic pains of influenza, and in gouty and rheumatic pain. **Lactophenin**, is analgesic and non-toxic; a feeling of comfort follows its use (Clevenger). **Belladonna**, is the best remedy for every kind of pain in the pelvic viscera (Anstie). **Atropine**, hypodermically in local pain, neuralgia, sciatica, glaucoma, etc.; when it succeeds, has more lasting effect than morphine (R); for sciatica, tic douloureux, etc. (B). **Iodides**, are magical in syphilitic nocturnal pains of head (B); the Ammonium Iodide, gr. iij ad ℥j Ol. Olivæ, with friction; causes the disappearance of nocturnal syphilitic pains (W). **Cimicifuga**, relieves many kinds of pain, as neuralgia of 5th, rheumatic headache, ovarian neuralgia, dysmenorrhea; inferior to Ergot in labor-pains or after-pains; ʒj doses (B). **Conium**, in cancer, rheumatism, neuralgia, ovarian pain, etc. (R); also for the fulgurant pains of locomotor ataxia, chronic alcoholism, sciatica, phthisis, etc., doses of ♏x of a fluid extr. of the unripe fruit every ½ hour, well watched (Madigan). **Iron**, with Belladonna, for the wandering pains of anemia, in which morphine is dangerous and bromides are useless (Waugh). **Aconitine**, locally over seat of pain; one of the most certain and powerful palliatives in neuralgic, rheumatic, and gouty affections (Wa); especially serviceable in neuralgia of 5th nerve (B). **Carbolic Acid**, as local anesthetic (R). **Cocaine**, as a local anesthetic to mucous surfaces, or hypodermically for minor operations involving a small area, as circumcision, eye operations, etc., has no equal; a 4 per cent. solution is generally employed (R); has many applications, as in odontalgia, otalgia, neuralgia of superficial nerves, etc. **Eucaine**, is fully as efficient as Cocaine in causing anesthesia of the mucous membranes, and is much less poisonous (Schleich); is absolutely harmless in medicinal doses, and does not affect the heart (Reichert). **Theine**, of very great value for neuralgic pain; affects the nerve outwardly along its course from the site of the injection (Mays). **Chloroform**, locally, inferior to other local anesthetics, two or three drops on cotton into the ear for faceache or toothache; the vapor on raw surface of cancers, for neuralgia of uterus, photophobic eye, etc.; by inhalation in renal and biliary colic, and to produce general anesthesia [which see] (R). **Ether**, spray for local anesthesia; inhaled for general anesthesia (R). **Guaiacol**, locally or by hypodermic injection, 1 part in 10 of olive oil, or mixed with equal part of glycerin for painting on the surface, is an efficient local anesthetic, and is used successfully in orchitis, in neuralgic pains of tuberculous subjects, also in sciatica and rheumatism (Moissy). **Chloral**, has no direct pain-relieving power, except in dangerous doses; to relieve pain and promote sleep the best agent is a combination of Chloral and Morphine; cautiously, if heart trouble, or in old drunkards; gr. xv–xxx with gr. ¼ (B): sometimes relieves neuralgia, also pain of chronic rheumatism, gall-stones, colic, gastralgia, and even of cancer (R). **Iodoform**, as suppository in painful diseases of the rectum or bladder (R). **Stramonium**, is used as ointment (R). **Duboisine**, used instead of Atropine (B). **Rhatany**, relieves the pain of ulcerative disease of mucous membranes, pain of burns, ulcers, and especially of blisters (Tr). **Cannabis Indica**, formerly used (B). **Aquapuncture** (B). [See under NEURALGIA.] **Galvanism**, of an affected nerve gives certain relief; the positive pole on point of emergence, negative over superior ganglion of cervical sympathetic (B). **Heat**, if pain is without fever or inflammation (B); warm injections soothe the pain of cystitis, prostatitis and abdominal pains generally (B). **Hot Water**, as bath, relieves pain most wonderfully: Napoleon, at St. Helena, suffering from cancer of the stomach, appreciated highly the pain-relieving power of the hot bath; often staying half and even whole days therein. **Cold**, when pain is inflammatory (B). [Compare the Lists of Analgesics, Anesthetics and Narcotics, on pages 31, 32, 58, *ante;* also in this part the articles entitled AFTER-PAINS, ANESTHESIA, BOILS, CHEST-PAINS, COLIC, GASTRALGIA, HEADACHE, HEPATALGIA, INFLAMMATION, LUMBAGO, MYALGIA, NEURALGIA, NEURITIS, ODONTALGIA, OTALGIA, OVARIAN NEURALGIA, RHEUMATISM, etc.]

℞. Antipyrini, ... gr. xv.
Cocainæ Hydrochlor., . gr. ss.
Aquæ Destil., ... ♏xv.

M. Sig.—One-half as hypodermic injection, or the whole when rapid action desired. (*Sée.*)

℞. Liquoris Magendie, . . ʒj.
Aquæ, . . . q. s. *ad* ℥ij.

M. Sig.—A teasp. to a dessertsp. every six or eight hours, for pain. Each drachm contains ⅛ grain of Morphine Sulphate. (*Potter.*)

Paralysis and Paresis.

Nux Vomica, in hysterical paralysis and in that from lead-poisoning; only in chronic cases (P); in paraplegia due to softening and wasting of the cord (Brown-Séquard). **Ignatia**, in paralysis of the lower extremities (P). **Strychnine**, hypodermically into the affected muscles, for hemiplegia, paraplegia, local, mercurial, paludal, rheumatismal, facial, infantile and diphtheritic paralyses; in that of the spinal muscles, of the bladder and all local forms (B); in hysterical paralyses (P); in all forms except cerebral and spinal paralyses (Barwell); internally in doses of gr. $\frac{1}{80}$ to $\frac{1}{12}$ (R). **Phosphorus**, with Cod-liver Oil in the paralysis of white softening of the brain (B); in hysterical paralysis (R); in myelitic paraplegia from excessive venery; the only drug which really affects the nerve-centres (W). **Belladonna**, when depending on chronic inflammation of the cord (R); externally as ointment along spine, with Ergot internally (Brown-Séquard). **Physostigmine**, into the eye in ocular paralyses (B); Physostigma in general paralysis of the insane, also in progressive muscular atrophy without much mental disorder, long-standing hemiplegia, paraplegia, locomotor ataxia (R). **Ergot**, in paralysis of bladder from over-distention (B); paralytic dysuria, sensation of but partial emptying of bladder (P); said to be useful in paraplegia (R); in paraplegia complicated with menstrual irregularity and forms of paralysis arising from spinal congestion (Wa); has cured cases of constipation of the paralytic when all the most powerful cathartics failed (Curran). **Cocculus Indicus**, valuable in hemiplegia, paraplegia, and paralytic stiffness (P). **Picrotoxin** has greatly benefited several forms, especially paralysis of the sphincters, hemiplegia from cold, and glosso-labio-laryngeal paralysis. **Cannabis Indica**, for retention of urine in spinal paralysis (R). **Rhus Toxicodendron**, is certainly efficacious in paralysis depending on rheu-
n (P). **Ammonium Iodide** and **Carbonate**, to aid in absorption of thrombi,

thus promoting cerebral nutrition in cases of incipient hemiplegia, due to endarteritis deformans reducing the lumen of the vessels in the brain (B). [See formula below.] **Arnica**, in paralysis of the bladder, and many forms (P). **Orchitic Extract**, has been thought to be beneficial in general paralysis [see page 162]. **Capsicum**, in ½ to 2-grain doses every 4 hours as general stimulant (P). **Colocynth**, in cerebral paralyses, sometimes seems to act favorably upon principles of revulsion or counter-irritation (P). **Mustard**, as an emetic to stimulate failing heart in certain forms of paralysis (P). **Senega**, in rheumatic paralysis, is a powerful help (P). **Nutmeg**, the Oil as external stimulant (P). **Oil of Bay**, has been given; is obsolete (P). **Cajuput Oil**, efficacious in palsy (P). **Counter-irritation** by blistering fluid, in peripheral paralysis of the 7th nerve (R). **Cod-liver Oil**, when low nutrition and faulty assimilation (Anstie). **Galvanism**, in hemiplegia and many forms (B). **Electricity**, faradization of the muscles affected; localized electricity probably of more importance in confirmed spinal paralysis than medicinal treatment. **Massage**, in infantile paralysis, given with Calcium Lactophosphate and Cod-liver Oil, and Strychnine injected into the muscles (B). [Compare HEMIPLEGIA, LOCOMOTOR ATAXIA, PARALYSIS AGITANS, TONGUE.]

℞. Strychninæ Sulph., . . . gr. iij.
Aquæ Destillatæ (fervid.), ʒx.
M. Sig.—For hypodermic administration: ♏x=gr. $\frac{1}{20}$ of Strychnine Sulphate.

℞. Ammonii Iodidi, ... ʒj.
Ammonii Carbonatis, . . . ℥ij.
Liq. Ammonii Acetatis, ℥vj.
M. Sig.—A tablesp. thrice daily. (B.)

Paralysis Agitans.

Hyoscyamus, full doses of the tincture will palliate the trembling; or Hyoscyamine, gr. $\frac{1}{32}$ gradually increased to gr. $\frac{1}{16}$ (B). **Hyoscine**, gr. $\frac{1}{100}$ or less, efficiently but temporarily controls the tremor of paralysis agitans (Weatherly). **Duboisine**, acts very well in most cases. **Conium**, has benefited some cases (Harley). **Gelsemium**, in full doses, to quiet the nervous irritation (Lavers); a combination of Conium, Hyoscyamus and Gelsemium [see under TREMOR]. **Potassium Iodide**, to promote absorption (Lavers). **Cocaine**, influences paralysis agitans more favorably than any other remedy, large doses and frequent administration are unnecessary (B). **Cannabis Indica**, in large doses, lowers reflex activity. **Picrotoxin**, has greatly benefited some cases. **Opium**, **Arsenic** and **Hyoscyamine** may be tried, but the disease is incurable, and nothing can be done except to attend to the physical comfort of the patient; there is no treatment which can be recommended as satisfactory in any respect (O). **Sodium Borate**, gr. xv–xlv daily, in 3 or 4 doses, produced most striking improvement in a case of paralysis agitans which developed after a fall upon the shoulder (Sacaze). **Phosphorus**, in small doses, with Cod-liver Oil, is very useful (R). **Hypophosphites**, the Syrup ought to be of service, if taken steadily for a long time. **Cod-liver Oil**, long continued, is more constantly useful than any other medicine (Anstie). **Orchitic Extract**, has been used with benefit [see page 162]. **Sulphur Baths**, are certainly of great value in this disease (Lavers). **Electricity**, the constant current, anode over the spine, cathode drawn along the course of the nerves from where they leave the vertebral column to the periphery (Id). [Compare CHOREA, TREMOR.]

Parotitis.

Aconite, in febrile conditions (R). **Mercury**, ⅓ grain of Gray Powder, 3 or 4 times a day, is very useful, relieving pain and swelling (R). **Poultice** of Flaxseed meal, is a good local application for the gland. **Leeching**, often gives speedy relief, when pain is great and resists hot fomentations (Wa). **Care** to avoid chilling, important. **Incision**, when suppuration occurs. **Stimulants** and **Tonics** internally are very necessary in symptomatic parotitis, occurring as a complication or sequel of other diseases, with adynamic symptoms.

Pediculi.

Mercury, as Citrine Ointment or a wash of Corrosive Sublimate solution, for lice on all parts of the body; the Oleate destroys lice immediately, and also kills the ova (R); for crab-lice the ordinary Blue Oint. is very disagreeable, and often toxic in its effect on the patient; a better preparation is Calomel in 5 per cent. oint., or the Bichloride, a 1 per cent. solution in alcohol, of which a teasp. to a pint of water, as a bath to parts twice daily. **Cocculus Indicus**, destroys pediculi (P); the tincture undiluted as a wash. **Staphisagria**, as Oil or an ointment of the powdered drug (R); "lice-bane" (P); the tincture a very efficient application, and much more cleanly than an oil or an ointment. **Acetum**, Vinegar will kill the nits, as it softens the adhesive chitin by which the ova are glued to the hairs. **Benzol**, is a very efficient, convenient and cleanly application for destroying pediculi capitis or pubis, if fire or light be carefully avoided: a single application is usually sufficient. **Ether**, washed over the parts, effectually destroys crab-lice. **Tobacco**, a decoction of the leaf is an efficient application, but requires care, especially if the surface is abraded (Wa). **Essential Oils**, will kill pediculi, as Rosemary, Anise (P); or powdered Pyrethrum (R). **Cleanliness**, cannot be dispensed with, and in many cases may alone be sufficient. Boil the underclothing. **Isolation** of person, and of brushes, towels, etc., to prevent infection. In Vienna the following prescriptions are used:—

℞. Bals. Peruvian.,
Petrolei, ... āā part. xv.
Olei Pichuri, ... part. j.
To be applied and washed off after 3 hours.

℞. Acidi Salicylici, ... part. ij–iij.
Aceti, ... part. xxv.
Alcoholis (80 per cent.), part. lxxv.
To be rubbed on with a bit of flannel. One application is often enough.

Pemphigus.

Antipyrin, internally, for the itching, is efficient. **Arsenic**, is curative, especially when chronic (B); largest dose, ♏v of Liquor Arsenicalis 3 times a day on full stomach (R); exercises a powerful influence (Wa). **Mercury**, as Citrine Ointment is largely used (Wa). **Potassium Iodide**, improves the condition in pemphigus (Wa); with good, simple diet; Quinine, Cod-liver Oil, etc. **Silver Nitrate**, gr. ij ad ℥j aquæ locally in pemphigus, after the bullæ have burst and excoriations remain (Wa). **Water Dressings**, on lint, covered with oiled silk, applied constantly, in pemphigus and rupia (Wa). **Cod-liver Oil**, with nutritious diet, is a powerful auxiliary to treatment (Wa). **Puncturing** the blebs and evacuation of their contents are necessary as soon as formed; cleanliness, the frequent use of a 1 in 1000 corrosive sublimate lotion, a dusting powder of equal parts of boric acid, zinc oxide and starch, are speedily effective (Mn); or buckwheat flour, lotion of Liquor Plumbi Subacetatus Dilutus, or painting with a 4 per cent. solution of Silver Nitrate in alcohol, after cutting off the tops of the blebs and cleaning the bases. The affection is highly contagious.

Pericarditis.

Aconite, when violent throbbing and extreme pain (R); of great value, if given early (P); proves in the highest degree serviceable, when object is to diminish vascular excitement or irritability (Wa). **Spigelia Anthelmia**, useful in rheumatic pericarditis (P). **Digitalis**, when rapid and feeble heart, cyanosis and dropsy (P, N); in second stage when heart flags, a tablespoonful of the infusion every 4 hours is beneficial. **Bryonia**, exceedingly valuable in second stage, that of exudation; fully equals any remedy in pericarditis (P). **Opium**, regularly in grain doses, every 3, 4, 6, or 8 hours, is very beneficial (Wa). **Veratrum Viride**, extract made by inspissating the juice of the root, of which gr. ij with gr. j of Calomel every 2 hours, valuable (Waring-Curran). **Quinine**, gr. xv–xx may suppress an acute attack, if given at critical moment (B); may be used as an antipyretic. **Counter-irritation**, has been much abused; useful at commencement, but not in acute inflammatory stage (B); by Iodine painted over the cardiac region, or flying blisters in the second stage. **Iron**, the tincture in full doses may be required in the second stage. **Poultices**, large, hot, often renewed (R). **Ice** may be used instead of poultices in the early stage. **Paracentesis**, by aspiration, may be required in the second stage. [Compare ENDOCARDITIS.]

Periostitis.

Mezereon, in the rheumatic and scrofulous form (P). **Mercury and Morphine**, the Oleate externally (R). **Potassium Iodide**, in syphilitic children, also in non-syphilitic periosteal thickening (R); holds the first place for syphilitic affections of the bones (Wa). **Ammonium Iodide**, cures periostitis most readily when syphilitic (Wa). **Staphisagria**, when the long bones are affected (P). **Iodine**, the tincture, or blisters locally, of great service in chronic form (R); under the external use of Iodine periostitis often rapidly improves (Wa). **Poultices**, after an early and free incision, when suppuration takes place (C). **Incisions**, carried deeply, should be made without waiting for fluctuation, when great tension exists and there is a tendency to suppuration; the sides of the abscess should then be brought together with compresses and a bandage (Gross). **Tonics** and **Stimulants**, as milk-punch, Quinine, Iron, and Opium, in full and sustained doses, are imperatively demanded in many cases (Gross). [Compare NODES, ONYCHIA.]

Peritonitis.

Phenacetin, as an antipyretic; is efficient and safe. **Aconite**, of great utility when sthenic reaction; [see Opium below]; should be given early in all inflammations of serous membranes (P). **Bryonia**, exceedingly valuable in second stage, when exudation (P). **Mercury**, when tendency to fibrinous exudation, is employed with good effect (W). **Opium**, to quiet intestinal movements (R); by far the best agent (P); Morphine, gr. ½ hypodermically, will often abort, if given early; Aconite and Opium, the tinctures, gtt. ij of the former with gtt. vj of the latter, in water every hour or two; a larger dose of opium if pain is severe (B); large doses of opium are easily borne in this affection (Wa). **Cocculus Indicus**, for tympanites; a few doses will often remove the pain and relieve distention (P). **Quinine**, strongly urged by Trousseau; is naturally indicated in most inflammations (P). **Turpentine**, for tympanites (P); turpentine stupes, v–xv drops of Turpentine on flannel wrung out of hot water during acute stage, then blisters for a short time (B). **Leeches**, to abdomen, if patient plethoric and of sthenic reaction, relieve pain (B). **Purgatives**, are inadmissible when from perityphlitis or inflammation of appendix vermiformis (B). **Poultices**, large, hot, and frequently renewed; should be thin, and covered with cotton-wool (R). **Ice**, to abdomen (B); cold relieves (W). **Hot Water**, as fomentations to relieve pain, sometimes cold compress better. **Ice**, sucked or swallowed, to assuage the vomiting; sips of cold water. **Diet**, after acuteness of the attack has passed; should be mild and unstimulating. [Compare PUERPERAL PERITONITIS.]

Peritonitis, Tubercular.

Quinine, in the acute form to reduce fever, as in acute tuberculosis, together with rest, poultices or warm fomentations, liquid diet, Opium, etc. (Whitla). **Cod-liver Oil**, by inunction with friction, also its continuous administration by the binder and mackintosh, is of great value in the chronic form of this disease (Id). **Arsenic**, children affected with tuberculosis involving the intestines and peritoneum have steadily and slowly improved and finally recovered under the Arsenic treatment (R). **Laparotomy**, has been done with uniform success and with complete cure of the disease in 80 per cent. of all cases of tubercular peritonitis in which the abdomen was opened, cleaned and drained (Tait): in 131 cases so treated 84 were cured and 23 greatly improved; only in 3 per cent. could death be ascribed to the operation (König); of 38 cases treated by simple laparotomy in 1896–97, 21 cases or 55 per cent. were completely cured (Chrobak). **Treatment** by medicine is useless, tapping is at best only of temporary service, incision and evacuation of the abdominal contents afford by far the best chances of recovery (Id).

Perspiration.

Belladonna, as liniment locally, also the tincture internally, especially in weakly children who sweat profusely (R). **Atropine**, gr. 1/200 to 1/100 hypodermically, or in exceptional cases even gr. 1/20 in pill, in sweating of phthisis and exhausting diseases (R); gr. 1/60 at bedtime for sweats of phthisis (B). **Duboisine**, may be used instead of atropine. **Pilocarpine**, gr. 1/20 thrice daily, checks profuse perspiration (R, Pf). **Naphtol**, in a 5 per cent. ointment or alcoholic solution, is a very efficient application for local sweating (Kaposi). **Potentilla Sarmentosa**, the Cinquefoil, an infusion of the vine, leaves, and root, may be drunk ad libitum, and is a very efficient remedy for night-sweats, having stopped them when Atropine failed to relieve (Pope). **Salvia**, the ordinary Sage-tea is very efficient, used internally and locally by sponging the body; the infusion for night-sweats of phthisis (Da C). **Quinine**, in that of exhausting diseases; in many cases a night-draught of Quinine, Zinc Sulphate and Sulphuric Acid is useful (R). **Opium**, as Dover's powder, may succeed in profuse colliquative sweating (R); a fact, though it is hard to account for it (Wa). **Agaricine**, is used successfully [see formula below]. **Agaricic Acid**, in dose of gr. 1/12 to 1/3, not hypodermically, one of the most efficient agents against sweating from various causes, especially that after influenza; in over two years' use, it only failed me in one case (Richards). **Camphoric Acid**, gr. x–xxx, dry on the tongue, not over 2 hours before the expected sweating, is remarkably efficient against sweating from various causes, especially that of phthisis even when very profuse (Jas. Wood). **Aromatic Sulphuric Acid**, to check sweats of phthisis; bad for digestion (B). **Muscarine**, has been used with great success in the sweats of phthisis and of other morbid states (R). **Zinc Oleate**, rapidly controls excessive and offensive sweating in the axillæ and groins on slight exertion, also the night-sweats of phthisis (Murrell). **Zinc Oxide**, gr. iij, with gr. ss of Ext. Belladonnæ, in a pill at bedtime for the sweats of phthisis (R). **Gallic Acid**, is very useful for the same condition, and may be combined with extract of Belladonna (B). **Tannic Acid**, may be used with benefit. **Aluminum**, the Oleate, checks hyperidrosis and antisepticizes the sweat, thus forming a useful application to the axillæ and groins of children (Wa). **Potassium Permanganate**, gr. j in ℥j of water, for fetid perspirations of axillæ, feet, etc. (B). **Salicin**, profuse sweats of hectic fever (Wa). **Salicylic Acid**, in solution with Borax, the most agreeable and efficient deodorant for fetid perspirations (B). **Carbolic Acid**, 2 parts, to 3 of glycerin and water, twice daily for fetid sweat (Wa). **Oils**, rubbed into the whole skin to prevent sweating accompanying exhausting diseases, as phthisis; but sponging with a weak acid wash better (R). **Ergot**, said to arrest sweating (R). **Sponging**, with acidulated water, or very hot sponging in phthisis (R). [Compare FEET.]

℞. Acidi Tannici, ... gr. xxx.
Pulv. Digitalis, ... gr. xv.
[illegible]nchonæ, ... q. s.
Sig.—One pill at bedtime.

℞. Agaricinæ (Merck), . . . gr. x.
Atropinæ Sulphatis, . . . gr. j.
Acidi Sulph. Aromat., . . ℥ijss.
Solve et filtra. Dose, ♏x in syrup or simple elixir, 5 or 6 hours before retiring.

Pertussis.

Antipyrin, is successfully employed. **Phenacetin**, is highly praised. **Aconite**, in all acute congestions (P); as a preventive or abortive remedy is very efficient when associated with Ipecac and cherry-laurel water (Dervieux). **Amyl Nitrite**, with Carbolic Acid, in steam atomizer, has proved a very efficient inhalation (Bayliss). **Ipecacuanha**, useful in many cases (R); ♏j for 5 years of age, every hour or two, gives the greatest relief (P); when bronchitic or pneumonic complications, combined with Ammonium Bromide (Wa). **Bromides**, relieve spasmodic element (B); that of Ammonium will readily cure many cases; gr. ij or iij ter die for infants (Wa). **Lobelia**, in spasmodic stages; well tolerated by children; ♏x of tinct. every hour for child 2 years old; also additional dose when cough is imminent (R, P). **Alum**, when acute stage is over and no complication exists, gr. ij–vj every three hours or less every hour, in glycerin or honey (R). **Bromoform**, in daily dosage of 5 to 20 minims, in glycerin and alcohol, very efficient for relief of paroxysms, and to reduce their number, but has little other influence on the course of the disease; must be pure, hence colorless; increasing doses should not be pushed very far, for fear of toxic symptoms (Bedford); is almost a specific, acting as a local anesthetic on the mucous membrane of the pharynx and larynx, given in doses of 1 to 5 drops 3 or 4 times daily (Carpenter); it may be used by inhalation instead of chloroform or ether, to lessen severity of the paroxysms. **Hydrogen Dioxide**, the solution, in drachm doses diluted with 2 or 3 of water, internally, cuts short the paroxysms and lessens the duration of the disease. **Benzol**, is a reliable pulmonary antiseptic, and has been used for many years in this affection with unvarying success (Robertson); the vapor may be diffused throughout the room, carefully avoiding a light or fire. **Ouabaïn**, in doses of gr. $\frac{1}{1000}$ every three hours, is highly efficient in all stages of this affection (Gemmell). **Resorcin** in solution, applied to the perilaryngeal mucous membrane, has aborted an attack at the outset in 24 hours, has cured well-marked cases in from 9 to 14 days, and is a perfect method of prophylaxis for children living with those suffering from the affection (Moncorvo). **Naphtalin**, burned in the patient's room, is of high value, both as a palliative and a curative agent (Chavernac). **Belladonna**, obviously of value in febrile stage, is of special use when dentition is in progress; relieves the congestion of air-passages and also the determination of blood to the head (P); good when profuse bronchial secretion; best in spasmodic stage; children bear this drug well, ♏x of tinct. may be given hourly to a child 3 years old (R). [Formula on next page.] **Sodium Benzoate** is highly efficient. **Conium**, or the Hydrobromate of Coniïne, in doses of gr. $\frac{1}{80}$ to gr. $\frac{1}{8}$ according to age, an efficient remedy (W). **Drosera**, small doses are effective (Murrell). **Chamomile Oil**, a very useful remedy (P). **Coccus Cacti** (Cochineal), in doses of gr. 1/3 thrice daily for infants has been highly recommended (W); proves effective in most cases. **Hydrocyanic Acid**, is serviceable in cough from habit after cessation of whooping-cough proper, or in the nervous sympathetic cough of the mother (P). **Myrtol**, may be expected to afford a large measure of relief (B). **Formalin**, as spray, is quite efficient. **Opium**, in the convulsive stage, to produce and maintain slight heaviness (R). **Cocaine**, a 5 per cent. solution, painted on tonsils, fauces, back of tongue, and if possible on larynx, is very efficient (Labrie). **Chloral**, gr. v–x in spasmodic stage, relieves quickly (B); gr. iij–viij every 4 hours (Porter). **Carbolic Acid**, as vapor, with steam atomizer; found to be very beneficial (J. L. Smith). **Castanea**, a decoction of chestnut leaves has been used with much success; dose ad libitum (B); the fluid extract, in ʒ-doses, exercises a remarkable influence over the cough (W). **Valerian**, said to control the paroxysms (R). **Nitric Acid**, well diluted in sweetened water, after the subsidence of the catarrhal stage (B). **Gelsemium**, in spasmodic stage (B). **Camphor Monobromide**, gr. v in mucilage and Syrup of Tolu 3 or 4 times a day, has been serviceable (B). **Zinc Sulphate**, gr. 1/4 –j with Ext. Belladon., gr. 1/6–1/2, has varying degree of success (B). [See formula below.] **Lactucarium**, the syrup as vehicle for cough mixtures (B). **Quinine**, in solution, locally to fauces (Dawson); the Tannate with Sodii Bicarb. of each 5, and Pulv. Acaciæ 100 parts, used with an insufflator (Pollack). **Petroleum**, on rags around head of the bed, is recommended highly by Hildebrandt. **Silver Nitrate**, when acute stage passed (Tr); probably inferior to Alum (Wa). [Compare COUGH.]

℞. Chloralis Hydratis, ... ʒj.
Potassii Bromidi, ... ʒij.
Syr. Pruni Virgin.,
Aquæ, ... āā ℥j.
M. Sig.—A teasp. thrice daily for infants in the convulsive stage. (*Dessau.*)

℞. Olei Morrhuæ,
Mellis Despumat.,
Succi Limonis, . . . āā partes æq.
M. Sig.—A teasp. or two as required. (*Sir Wm. Gull.*)

℞. Amyli Nitritis, ... ʒss.
Acidi Carbolici, ... ♏x.
Glycerini,
Alcoholis, ... āā ℥ss.
M. Sig.—Use by inhalation with steam atomizer. (*Bayliss.*)

℞. Bromoformi, ... ♏xvj.
Glycerini, ... ℥jss.
Tinct. Cardamom. Co.,
Alcoholis, ... āā ʒij.
M. Sig.—A teaspoonful at commencement of the paroxysm. (*Bedford.*)

℞. Bromoformi, ... ♏xlviij.
Alcoholis, ... ℥iv.
Tinct. Cardamom. Co., . . ℥iij.
M. Sig.—A teaspoonful in water three or four times daily. (*Carpenter.*)

℞. Zinci Sulphatis, ... gr. iv.
Tinct. Belladonnæ, . . . ♏xlviij.
Aq. Anisi, ... q. s. *ad* ℥ij.
M. Sig.—20 to 60 drops, according to age of child, every three hours.

Pharyngitis.

Aconite and **Belladonna**, for acute attacks (B); when high temperature (R). **Belladonna**, is very useful, relaxes the pharyngeal muscles (W). **Capsicum**, ʒj of the tincture to O½ of water, as gargle in the very early stage only (R). **Alum**, gargles, in chronic throat inflammations (R). **Silver Nitrate**, gr. v–xx to the ℥, on sponge probang, successful if systematically applied (B); in early stage of inflammation; also on brush, or as spray in the chronic form (R): the solid stick to each diseased follicle, after scraping (A). **Ammonium Chloride**, gr. ij with ♏xv of Tinctura Cubebæ, every half hour, often controls acute pharyngitis; when a gouty diathesis exists add ♏x of the Ammoniated Tincture of Guaiac, and give every hour (Smith). **Xanthoxylum**, a decoction of the bark locally to throat, and ♏x–xxx of the fluid extract thrice daily, a very successful remedy for chronic pharyngitis (B). **Tannin**, by insufflation to affected surface (B). **Cubeb**, powdered, locally, useful (B). **Glycerin**, pure, locally, with Tannic Acid, very serviceable (B); in chronic inflammation of the throat (R). **Glycozone**, frequently applied, is of benefit in follicular pharyngitis (Edson). **Hydrastis**, the fluid extract locally, also ♏v–x internally (B). **Alcohol**, diluted, as gargle in relaxed throat (R). **Cimicifuga**, when pharynx dry and spotted over with inspissated mucus (R). **Ipecacuanha**, the wine as spray in non-inflammatory sore throat, with hoarseness from congestion of vocal cords (R). **Pomegranate Bark**, as gargle (P). **Resorcin**, in strong solution, a very efficient application (Tymowski). **Potassium Chlorate**, as lozenge to stimulate the follicular secretions to a healthy condition (A). **Iron**, **Quinine**, and **Strychnine**, as tonics, are indicated (A). **Zinc Sulphate**, as gargle, occasionally employed in relaxed throat (R). **Inhalation** of vapors, or of pulverized fluids, by the atomizer, found very beneficial (Wa). **Food**, of piquant kind, spices, pepper, mustard, etc., should be strictly prohibited; all fluids should be used at a moderate temperature (A). **Water**, by throat compress, relieves; also in daytime, in obstinate cases. **Rest**, to voice and cultivation of beard, are useful aids. [Compare THROAT, SORE, TONSILLITIS, and Formulæ for Gargles on page 576.]

℞. Tinct. Aconiti,
Tinct. Belladonnæ, . . . aa ʒ ss.
Tinct. Guaiaci Ammon., . ℥ v.
Syr. Limonis, ... ℥ ss.
Aquæ Cinnamomi, q. s. *ad* ℥ iv.
M. Sig.—A teasp. every 3 hours for acute pharyngitis.

℞. Tinct. Aconiti, ... ʒ ss.
Ac. Hydrocyan. Dil., . . ♏xl.
Liquor Ammonii Acetat.,*ad* ℥ iv.
M. Sig.—Teasp. every 2 or 3 hours according to the severity of the case. In acute and subacute pharyngitis.

℞. Aluminis, ... ʒ ss–ij.
Sodii Boratis, ... ʒ jss.
Glycerini,
Tinct. Myrrhæ, ... aa ℥ ij.
Aquæ, . . . q. s. *ad* ℥ iv.
M. Sig.—Use as an astringent gargle, 4 or 5 times a day

℞. Acidi Tannici, ... gr. lx.
Alcoholis, ... ♏xxx.
Aquæ Camphoræ, q. s. *ad* ℥ iv.
M. Sig.—An astringent gargle, to be used several times a day.

Phimosis.

Belladonna, as ointment, the extract 7 to 20 parts of Lard, has proven effectual (Wa). **Lupulin**, 5 to 15 grain doses, of advantage after operation, to keep the penis at rest (Wa). **Surgical**, division of the prepuce by bistoury and director; circumcision (D). **Cocaine**, a 4 per cent. solution injected at several points around the edge of prepuce, as local anesthetic during the operation of circumcision. **Chloroform**, or **Ether**, as an anesthetic in paraphimosis, before attempting reduction (Wa).

Phlebitis.

Hamamelis, has as decided an influence on the venous system as Aconite has on the arterial (Pf). **Mercury**, in frequent and liberal doses, to early and decisive constitutional impression; the best form being Calomel or Blue Mass (Gross). **Rest**, fomentations, poultices, early incision of abscesses, aperients, Opium to relieve pain and insure quiet of mind and body (D). **Blisters**, over the course of an inflamed superficial vein (R). **Diet**, nutritious, also wine, especially if great loss of blood (D). **Stimulants**, as Quinine and Iron, especially the tincture of the Chloride, also milk-punch, are needed to combat the depression which is sure to arise: the disease is always dangerous and often fatal (Gross). **Incisions**, must be freely made if abscesses form, and the internal organs watched for multiple abscess. **Ulceration**, if it occur, must be watched for hemorrhage, which should be arrested by compression and styptics (Gross). [Compare PHLEGMASIA, VARICOSIS.]

Phlegmasia Alba Dolens.

Belladonna, and Mercury, equal parts, as ointment, often of much benefit (Wa). **Hamamelis**, has specific action on the venous system (P); extolled by Dr. Preston (R). **Blisters**, in early stage; are extremely useful if judiciously employed (L). **Ammonium Carbonate**, often valuable where great prostration; full doses (Wa). **Hydrochloric Acid**, ʒj of dilute acid in Oij of Barley-water, with ℥ss of Potassium Chlorate, to be taken daily (Mackenzie). **Opium**, large doses internally, with leeches and anodyne ointments (Wa); Laudanum, sprinkled on hot fomentations, if pain severe (L). **Leeches**, of great service during the acute inflammatory stage (Wa). **Bandaging**, when the more acute symptoms subside; at first with flannel, afterwards with ordinary roller bandage (L). **Regimen**, should be tonic (L). **Water**, by compresses in active stage; hot and cold douches, in chronic form.

Phlegmon.

Aconite, or **Belladonna** are certainly efficacious; Aconite best (R). **Sulphides**, to abort, or when inevitable, to promote; gr. ss–j of Potassa Sulphurata every hour or two (B). **Silver Nitrate**, a strong solution may check if applied early in the vicinity (B). **Carbolic Acid**, injections; a 2 per cent. solution (B); used with great success (W). **Iodine Injections**, after evacuation (B). [Compare ERYSIPELAS.]

Photophobia.

Atropine, a neutral solution of the Sulphate, gr. j to the ℥, for adults, dropped into the eye every four hours (C); if much lachrymation, so as to dilute the solution, it may be applied more frequently; in some cases it irritates and has to be abandoned (Wa). **Conium**, in scrofulous photophobia, gr. ss of Coniine in ʒj of Ol. Amygdalæ, locally twice or thrice daily; or the vapor of Coniine (Wa). **Mercury**, Calomel by insufflation (C). **Canthoplasty**, for the spasm of the orbicularis in severe photophobia (C). **Glasses**, of cobalt blue, the best color (R). **Arsenic**, in the condition described by old writers as strumous ophthalmia, with its attendant photophobia, is very valuable as an internal remedy (C). **Chloroform**, the eye exposed to the vapor of a few drops, in severe photophobia will be speedily relieved (Jones). **Croton-Chloral**, gr. v–x, in young people and those suffering from syphilitic corneo-iritis (Bader). **Potassium Chlorate**, internally, is most useful in some cases (Vernon). **Cocaine**, in 2 to 4 per cent. solution, a few drops upon the conjunctiva, will be found promptly efficient in most cases of severe photophobia.

Phthisis.

Creosote, gives excellent results (Bouchard); is directly curative, at least in the initial stage of the disease (Fräntzel); promotes the sclerotic change by means of which recovery is found to occur (Jaccoud); Morson's beechwood Creosote should be used, in doses of ♏j in whiskey and glycerin, every 3 or 4 hours; should be largely diluted to prevent irritation, and continued for many months [see page 293]; relieves cough, diminishes expectoration, stops night-sweats, increases weight, decreases fever, promotes appetite, and in many cases improves the local condition, as shown by the physical signs (Robinson); the Carbonate (*Creosotal*), the Valerianate (*Eosote*), and the Phosphate, have each given good results. **Guaiacol**, the chief ingredient of creosote and equally efficient; the Carbonate (*Duotal*), in doses of gr. vj to viij, up to ℥jss daily, is better borne and an efficient substitute [see page 294]; gr. iv four times a day increased to gr. vj six times a day, also inunctions of Europhen in Olive Oil, ʒj in ℥ijss, has given excellent results in many cases. **Benzosol**, contains 54 per cent. of Guaiacol, which it yields up in the intestines: in doses of 4 grains, gradually increased to 12 grains, thrice daily, it has given results in phthisis, equal if not superior to those from creosote (Walzer). **Iodine**, should be more used than it is; the compound solution, gtt. j–iij thrice daily, or when anemia and not much fever use Ferrous Iodide, ♏xv of the syrup pushed to ʒj ter die (Da C); as inhalation in chronic phthisis; to lessen expectoration and cough; also as liniment painted under clavicles, to allay harassing cough, and to check secretion (R); extremely useful; also as intrapulmonary injection, a solution of the compound tincture of Iodine, 1 to 4 of distilled water, of which ♏x–xx injected once every 4 or 5 days, through the 1st, 2d, or 3d intercostal spaces, anteriorly, or in the axillary region, avoiding the pericardium and great vessels (Robinson): Iodine or Iodoform, with Creosote, Carbolic Acid, Eucalyptus, Chloroform and Alcohol or Ether, as a combination for an antiseptic inhalation (Br); a compound solution hypodermically, each ʒ-dose containing Iodine gr. ss, Bromine gr. $\frac{1}{14}$, Phosphorus gr.

$\frac{1}{100}$, Thymol and Menthol of each gr. $\frac{2}{3}$, used in 35 cases with excellent results (Ingraham). **Europhen** by inunction, with Creosote internally, has given curative results even in the breaking-down stage, and almost always cures incipient cases (Flick); [see formula p. 799]. **Iodoform** internally, has proved extremely effective in all forms, as witnessed by numerous observers in various countries (S. Smith); though not one of the most active germicides, it is very destructive to the bacillus tuberculosis (B). **Iodol**, may be advantageously substituted for Iodoform (B). **Ichthyol**, is far superior to creosote or cod-liver oil, and is very useful in pulmonary tuberculosis (Cohn); a mixture of equal parts of Ichthyol and water, of which 4 drops are taken thrice daily, the dose being increased by one drop daily until the maximum of 40 drops three times daily is reached (Id). **Cod-liver Oil**, holds first rank as a remedy and food in the chronic forms; a teasp. after meals ter die is enough; when not well borne may be combined with Aqua Calcis, Comp. Tinct. of Gentian; or with Ether when not digested (B, R); is of great utility by improving nutrition, and by affecting the tubercle; give ℥ss thrice daily one hour after meals, with ♏v–xv of Ether, or an equal quantity of malt or whiskey; do not give it in hot weather (Da C). **Alcohol**, an important remedy; may be given with Cod-liver Oil; or Spt. Frumenti, ℥j–℥ij with some bitter, immediately after meals; if it disagrees, it harms: curiously, it induces an intractable form of phthisis (B). **Sulphurous Acid**, by inhalation, spray or fumigation, in chronic phthisis (R). **Formalin** ʒj, Glycerin ʒiv, Distilled Water ℥v, as spray for 10 or 15 minutes 4 times in 24 hours in the early stage (Green). **Aurum**, the Bromide of Gold and Arsenic internally, with inhalations of Papoid as glycerole by the atomizer, gave astonishing improvement in two cases of fibroid phthisis with cavities, due to neglected pneumonitis; also in a case of grinders' consumption (E. A. Wood); the Chloride has rendered excellent service in the hands of Gibbes and Shurly. [See *infra*, under Chlorine.] **Arsenic**, valuable in chronic forms as no other remedy; but not in caseous phthisis or where much hectic; may be given by stomach or fumigation (B); as cigarettes, useful in the diarrhea, probably diminishes temperature, caution required! (R); of great value in early stage, in later stages it is of no use; Arsenous Acid, gr. $\frac{1}{40}$, or Fowler's solution ♏iij thrice daily (Da C). An organic compound of Arsenic, named *Cacodyle*, is attracting much attention in France as a cure for phthisis; used hypodermically in doses of 5 to 10 centigrams daily, it is free from unpleasant results (Gautier); under it certain forms, with excavations or with softening of the tubercles, are greatly improved (Letulle).

Aconite, in small doses for the irritative fever, is a remedy of much value (Da C). **Antipyrin**, in a 2½-grain dose hourly for 3 doses daily, for the hectic fever. **Phenacetin** is better borne and is efficiently antipyretic; extensively employed in the hectic of phthisis. **Cinchona**, for the hectic and sweats, Quinine, gr. xv–xx (B); if small doses fail, a dose of 6 or 8 grains at once, or in portions repeated hourly (R). **Ipecacuanha**, the wine as spray to throat when bronchial asthma and emphysema combined with fibroid phthisis (R). **Opium**, or **Morphine**, in a viscid vehicle for cough, or as lozenges when cough due to inflamed throat (R); must in time be given for the cough, which is an irritative one. **Codeine**, gr. ⅛ to ¼ in simple elixir, is useful and does not constipate (Da C). **Apomorphine**, with Morphine, makes a good combination for many symptoms, especially for dyspnea, continual cough and thick tenacious mucus (Br). **Cannabis Indica**, an aqueous solution [see page 243] relieves the cough and aids the patient in many ways (Lees). **Hydrogen Dioxide**, the solution internally, in doses of ʒj to iij diluted with 3 parts of water, renders good service by promoting digestion, palliating cough, and increasing the activity of chalybeate remedies. **Terebene**, with Thymol and Carbolic Acid, equal parts of each, of which ʒss to a pint of hot water as an inhalation; is extremely useful for the dyspnea (Camman). **Verbascum**, the Mullein-plant, has long been a popular remedy in phthisis; it facilitates expectoration, improves the general condition, and palliates the cough. **Calcium Phosphate**, in the diarrhea, and in chronic forms of phthisis with little or no fever (R). **Cimicifuga**, useless in tuberculosis, but in phthisis it relieves cough, improves appetite, lessens intercurrent bronchitis, and so improves the patient's general condition (Wa). **Cocaine**, locally for the throat symptoms, to be applied just before meals are eaten (Da C). **Sanguinaria**, helps expectoration, and revives the enfeebled stomach (P). **Camphorated Naphtol**, undiluted, or ♏ij in olive oil hypodermically, used with very good results in 15 out of 32 cases so treated (Reboul).

Chloroform, with glycerin or honey, for the cough in fibroid phthisis (R); by inhalation in small quantities for the cough and dyspnea, gave extraordinary relief to a noble patient of mine during the last 8 months of his life (Spencer Wells); by continuous inhalation, kept short of full anesthesia, may be effective as a germicide in phthisis (Potter, in *Pacific Med. Jour.*, Oct., 1890): ♏xv–ʒj or ʒij, by inhalation twice daily, continued for a long period of time, will give better results than any other known remedy (Flick): Creosote, with Chloroform as a vehicle, may be taken into the lungs from a globe nebulizer, producing the most happy results (Id). **Chlorine gas**, by inhalation, also the hypodermic use of Iodine and Chloride of Gold and Sodium, extensively employed in pulmonary consumption with good results (Gibbes and Shurly). **Ferrum**, often prescribed; has no especial influence on deposit (B); is prescribed in tuberculosis (Tr); the Liquor Ferri Perchloridi, ʒj ad ℥j aquæ, the most serviceable local application in laryngeal phthisis, diminishing irritability of the mucous membrane, and quieting cough (Mackenzie). **Mercury**, gr. $\frac{1}{100}$ of Corrosive Sublimate every two or three hours, for the diarrhea (R). **Benzoin**, as inhalation, to lessen cough and expectoration (R). **Mineral Acids**, for the indigestion; especially the dilute Hydrochloric (B). **Prunus Virginiana**, has a domestic reputation, probably due to its influence over cough; the syrup is much used as a vehicle for cough-mixtures (B). **Hypophosphites**, are very useful in chronic cases (B); have no special effect (Da C). **Digitalis**, as an antipyretic; deranges intestinal canal, therefore injurious in phthisis (B). **Copper Phosphate**, in nascent form soluble in an alkaline body, is held to be specific by Prof. Luton of Rheims; his formula contains Neutral Acetate of Copper 0.15, Cryst. Phosphate of Sodium 0.75, Glycerin and Pulv. Liquorice, āā q. s. for one pill. **Copper Sulphate**, gr. $\frac{1}{12}$, or **Silver Nitrate**, gr. $\frac{1}{4}$, or **Bismuth**, gr. xx, for the diarrhea (Da C). **Camphor**, in oil, as subcutaneous injections during the period of softening [see page 241]. **Amick Chemical Cure** consists in the use of Calomel, Iodoform, Guaiacol, etc., as described by Dr. N. B. Shade in various journals (Waugh). [See under PATENT MEDICINES in Appendix.] **Aseptolin**, lately put on the market by Edson, is described on page 89. **Tuberculin**, (Koch's lymph) described on page 511; a deceptive bubble which for a short time commanded the attention and admiration of the whole world, but which has been ruthlessly pricked by the critical scalpel in the hands of the father of modern pathology (Senn). **Tuberculocidin**, a derivative of Tuberculin (Klebs); is described on page 514. **Antiphthisin**, is Dr. Klebs' latest remedy, and is fully described on page 514. **Antitoxin**, advocated by Maragliano and Paquin, is described fully on page 180. **Nuclein**, has been employed with encouraging results by Vaughn [see page 161]. **Baths**, sea-bathing, if chronic, little or no fever, without active deposition of tubercle, or scrofulous pneumonia; Turkish baths for the cough (R). **Grape-cure**, is serviceable (B). **Aliment**, should be nutritious and digestible, malt liquors better than wine or spirits: extract of malt, cod-liver oil, plenty of meat, and alcohol in moderation (Da C); warm clothing, bathing and friction of skin, moderate exercise, and a suitable climate. **Forced Alimentation**, when anorexia appears, and superalimentation at all times, necessary to successful treatment; washing out the stomach daily by syphon-tube, with warm water alkalinized with Borax, and then feeding through the tube (Robinson). **Climate**, the best by far is that of Egypt or Algeria; next coming New Mexico, Southern California, especially in the desert along the Colorado River, South Carolina and portions of Georgia and Florida; the latter being especially suitable for cases having a co-existing bronchitis; for some cases Colorado is very good, and the Adirondack region for early cases in which there is no tendency to hemorrhage (Da C). [Compare COUGH, HECTIC FEVER, HEMOPTYSIS, LARYNGITIS TUBERCULAR, MENINGITIS TUBERCULAR, PERITONITIS TUBERCULAR, PERSPIRATION, TUBERCULOSIS ACUTE, TUBERCULOUS AFFECTIONS.]

℞. Quininæ Sulphatis, . . . gr. xviij.
Pulv. Digitalis, ... gr. vj.
Pulv. Opii, ... gr. iij.
M. ft. pil. no. xij. Sig.—One pill thrice daily, for the irritative fever. (*Niemeyer.*)

℞. Iodoformi, ... ʒ jss.
Creosoti, ... ♏xv.
Ol. Eucalypti, ... ♏xxx.
Chloroformi, ... ʒ iij.
Alcoholis,
Ætheris, . . āā q. s. *ad* ℥ ij.
M. Sig.—10 to 20 drops on the sponge of a perforated zinc inhaler, to be worn 20 minutes thrice daily. (*Brunton.*)

℞. Europhen, ... ʒ j.
Ol. Rosæ, ... ♏j.
Ol. Anisi, ... ʒ j.
Ol. Olivæ, ... ℥ ijss.
M. Sig.—℥ ss by inunction at bedtime; wash off with bay rum or whiskey in the morning. (*Flick.*)

℞. Iodoformi,
Creosoti,
Pulv. Benzoini,
Bals. Tolu., ... āā gr. j.
In pill, of such 2 to 4 daily. (*Huchard.*)

℞. Tinct. Belladonnæ, . . ʒ ij.
Syr. Scillæ, ... ℥ ij.
Morphinæ Sulph., . . . gr. j.
Syr. Tolutani, . q. s. *ad* ℥ iv.
M. Sig.—Tablespoonful at bedtime, for cough and restlessness; to be repeated if necessary.

℞. Codeinæ, ... gr. xv–xx.
Alcoholis, . . . q. s. *ad* solv.
Potassii Cyanidi, ... gr. xij.
Syr. Pruni Virgin., . . ℥ iv.
Aquæ, ... q. s. *ad* ℥ vj.
M. Sig.—A teasp. 4 to 6 times daily, for the cough. (*Potter.*)

℞. Arseni Iodidi,
Strychninæ Sulph.,
Hydrarg. Chlor. Corr., āā gr. j.
Quininæ Sulph.,
Iodoformi, ... āā ʒ ij.
M. ft. pil. no. xl. Sig.—One thrice daily as a tonic in tubercular cases. (*Mann.*)

℞. Creosoti (beech-wood), . ♏vj.
Glycerini, ... ℥ j.
Spt. Frumenti, ... ℥ ij.
M. Sig.—For one day's use, as directed in ℥ ss doses. (*Robinson.*)

[For a Cod-liver Oil Emulsion see formula on page 572.]

Pityriasis.

Alkaline and Tonic Remedies generally control mild cases, together with baths and emollients; the more severe ones requiring constant envelopment in linseed oil or cod-liver oil (Bulkley). **Mercury**, in obstinate cases, Donovan's solution, is highly successful (Wa); the yellow Iodide, gr. x to ℥j of lard, or a 5 per cent. solution of the Oleate of Mercury in Oleic Acid with one-eighth part of Ether, applied by a camel's-hair brush (B); Citrine ointment, especially when the hairy parts of the face are affected (R); an ointment of Ammoniated Mercury and Calomel is very useful in ordinary cases of dandruff or pityriasis simplex (Bronson). **Sulphur**, ʒj to ℥j of vaselin applied every morning to the scalp, with sweet almond oil anointing at night (Jackson). **Soap**, the liniment of soft soap as shampoo every morning for cleanliness, or Borax and water, or the yolks of three eggs beaten up in a pint of Limewater with ℥ss of Alcohol, all of which make good shampooing mixtures (Jackson). **Borax**, to cleanse the scalp, a saturated solution; or the Glycerite of Borax (R). **Lead**, the Liquor Plumbi, with glycerin, equal parts of each, and two of water, as lotion for cases where there are high inflammation and abundant weeping (R). **Carbolic Acid**, 2 parts to 3 of glycerin and water, twice daily, with the daily use of a carbolized soap, is often effectual (Wa). **Sulphides**, ℥ss of Potassa Sulphurata to Oj of Lime-water, as a lotion, or the Barèges Pomade [see formula on next page]. **Thyroid Extract**, as a stimulant of the cutaneous circulation, has been used with satisfactory results [see page 158]. **Myrtol**, is curative (B). **Baths**, frequently, and hard rubbing after shampooing the scalp; avoid stimulating food in bad cases, as well as the use of a fine-toothed comb on children's heads. [Compare SEBORRHEA, and for PITYRIASIS VERSICOLOR see TINEA VERSICOLOR.]

℞. Sodæ Sulphuratæ,
Sodii Carbonatis, . . . aa ʒij.
Axungiæ, ... ℥ijss.
M. Sig.—*Pomade de Barèges.*

℞. Hydrarg. Ammoniat., . . gr. xx.
Hydrarg. Chlor. Mitis, . . gr. x.
Petrolati, ... ℥j.
M. ft. unguent. Sig.—Local use.

Plague, Bubonic.

Strychnine, should be used as a routine treatment and commenced early in the disease; also with or without Ammonium Carbonate in the later stages when the pulse begins to fail (Lowson). **Morphine**, is by far the best hypnotic if given with judgment, gr. ⅛–½ hypodermically at the onset to relieve suffering and induce sleep, later on gr. ⅛ suffices (Id). **Hyoscine**, gr. $\frac{1}{200}$–$\frac{1}{75}$, or **Chloral** gr. xx with Potassium Bromide gr. xxx, are of service for the same purpose (Id). **Salol**, gr. x every 4 hours, as an intestinal antiseptic for the diarrhea, if urgent (Mn). **Belladonna** with glycerin, applied to the buboes in their early stage; if red and inflamed they must be poulticed and when softening occurs they should be incised and treated with Iodoform (Mn). **Mercuric Chloride** and Carbolic Acid solutions, were injected into the glands with temporary benefit, during the Hong-Kong epidemic (Payne); good results followed the injection of Mercuric Chloride and Potassium Iodide (Cantlie). **Iodine**, as liniment for indolent bubonic swellings (Mn). **Calomel** in full dose, followed by a saline, usually relieves the vomiting (Lowson). **Hydrocyanic Acid** and Morphine, in effervescing mixture, also ice pellets, for the vomiting, if calomel does not succeed (Id). **Cold**, by ice-bags to the head and neck, when headache and high fever (Mn). **Water**, sponging the body with warm water every hour to reduce hyperpyrexia, is safer than antipyretic drugs (Id). **Antitoxin**, Yersin's serum, from an immunized horse, was used in 26 cases in China with 24 reported recoveries, but further experience in India has not confirmed its value (Id). **Vaccination** by Haffkine's protective inoculation of healthy persons, causes severe reaction; the results, though encouraging, are not conclusive as to its value (Id). **Treatment** is very unsatisfactory, no specific or antidotal drug has ever been discovered. As in other asthenic fevers, give the patient an abundant supply of fresh air, avoid over-crowding, use cold affusions or baths at the height of the fever, also such cooling drinks as may promote his comfort. Alcoholic stimulation appears to be of less value than in typhus (Payne). **Diet**, would seem to be of minor importance in a malady of such short duration (Payne in Allbutt's *System*).

Plethora.

Aconite, is useful for affections of plethoric subjects, and is decidedly the best remedy for apoplexy in the plethoric (P). **Arsenic**, is used with advantage when there is determination of blood to the head (Wa). **Sulphur**, as a mild purgative for plethora from cessation of the menses (Wa). [Compare ABDOMINAL PLETHORA.]

Pleuritis.

Aconite, no remedy more effective prior to the stage of effusion (R); [see under INFLAMMATION]; the tincture in doses of ½ drop every 3 hours to a child 3 years old, for 2 or 3 days (J. Lewis Smith). **Veratrum Viride**, gtt. viij of tincture every 3 hours, with a drop added to each dose until the pulse is reduced or nausea occurs (Wa); opinions differ as to whether it should be used in sthenic or asthenic forms (R). **Bryonia**, exceedingly valuable in second stage; should follow Aconite (P). **Tartar Emetic**, in early stages and young plethoric subjects, when much febrile action, small doses, gr. $\frac{1}{16}$ to $\frac{1}{4}$, may be useful (Wa): [see under INFLAMMATION.] **Digitalis**, as antipyretic (R); deranges intestinal canal (B); Aconite preferred (P); the tincture in doses of one drop every 3 hours to a child 2 years old (J. Lewis Smith). **Quinine**, has abortive power, increased by combination with Morphine, gr. xv + gr. ss; also as restorative tonic in low-type cases (B). **Opium**, cannot be too highly extolled (P); is especially beneficial; gr. ss of Morphine hypodermically at the beginning will often cut short an attack; during the disease its effects are very beneficial; a slight physiological effect should be maintained (B); Morphine for severe pain (R). **Antipyrin**, is found effective in promoting the absorption of pleuritic effusions [see page 173]. **Diuretin**, has caused a large pleuritic effusion to disappear [see page 233]. **Guaiacol**, locally to promote absorption of effusion [see page 294]. **Potassium Iodide**, to promote absorption of effusions, steadily for a long time (R); also chest painted with tincture of Iodine, one day on each wall alternately; may be washed off with Potassium Iodide, Alcohol or Ether (B); as a diuretic to remove effusion (Clark). **Iodine**, as injections, with great benefit and without risk, in empyema and hydrothorax (P). **Burgundy Pitch**, the plaster externally as a mechanical support (P). **Asclepias**, the popular pleurisy-root, is a favorite remedy in the South (W). **Pilocarpus**, in subacute cases to remove fluids (Caro); or Pilocarpine Nitrate, gr. $\frac{1}{7}$ bis die, for children (Vigier); is too depressing and therefore unsafe (Smith). **Sodium Chloride**, ʒss in ℥j of water, flavored with Licorice, in tablesp. doses every 3 hours, often very useful in causing absorption of pleuritic serous exudations; but is contraindicated when exudation is purulent (Br). **Bloodletting**, by cups or leeches, useful by reason of counter-irritation produced, and to relieve pain, only in robust sthenic cases (B). **Blisters**, often greatly abused; are harmful during inflammatory stage (B). **Poultices**, large, hot, and frequently renewed (R). **Water**, cold wet-pack to chest probably better than a hot one, pinned tightly to limit movement of chest-walls (B). **Thoracentesis**, by aspiration, if the quantity of fluid seriously embarrasses the respiration. [For CHRONIC PLEURISY see EMPYEMA, also compare HYDROTHORAX, PLEURO-PNEUMONIA.]

℞. Potassii Acetat., ... ʒj.
Infusi Digitalis, q. s. *ad* ℥iv.
M. Sig.—Teasp. every 3 hours to a child of 4 or 6 years, in the second stage.

℞. Morph. Sulphat., . . . gr. j.
Tinct. Aconiti, ... ♏xxiv.
Liq. Potassii Citratis, . ℥ij.
M. Sig.—A teasp. every 3 hours.

Pleurodynia.

Cimicifuga, curative when rheumatic and valuable in sympathetic cases from irritability of uterus (P); or uterine derangements (R, Wa). **Croton Oil**, in obstinate pleurodynia especially when blackened feces (R). **Belladonna**, the plaster or liniment; the latter generally best (R). **Chloral**, made liquid with an equal weight of Camphor and rubbed in gently, often affords instant relief in severe pleurisy (R). **Sodium Salicylate**, gr. xv–xx, every 2 or 3 hours, useful in most cases (Hughes). **Ether**, as spray, sometimes immediately and permanently removes the pain (R). **Opium**, as liniment rubbed in after warm fomentations (Wa); or a hypodermic injection of Morphine (R). **Iodine**, as liniment painted on the chest, often relieves where mustard fails (R). **Blistering**, often successful when other means fail; sometimes strong vesication is necessary (R). **Rest**, is important and may be obtained by strapping the affected side with strips of adhesive plaster. **Poultices**, very hot, followed by application of lint and oilskin; Belladonna Liniment generally better (R). **Mustard**, as a poultice, is generally efficient, and can be renewed when the pain returns (R). [Compare MYALGIA, NEURALGIA.]

Pleuro-pneumonia.

Bryonia, is often of great service; limits effusion and assists absorption (P). **Carbolic Acid**, a 2 per cent. solution injected parenchymatously, once or twice a day, has had remarkable success (B). **Sanguinaria**, as a contra-stimulant (P). **Turpentine**, as a fomentation (P). **Arnica**, the tincture in doses of ♏x every 3 or 4 hours, very useful in controlling the heart's action (Wa). **Pilocarpine**, gr. ss, or ʒij of the tincture of Jaborandi, benefits cases of pleuro-pneumonia (Wa). [Compare PNEUMONIA.]

Pneumonia.

Aconite, gives good results in catarrhal and fibrinous forms (B); has marked effect (R); very valuable in first stage (P); in several cases it apparently cut short the attack (Wa); to reduce circulation either Aconite or Veratrum Viride, until the pulse is impressed (Da C). **Veratrum Viride**, valuable (P); in the very incipiency (B); opinions differ as to whether it should be used in sthenic or asthenic cases (R). **Guaiacol Carbonate**, gr. xx in emulsion every 2 hours, gave excellent results in a case of double pneumonia (Thomson); in 13 cases successfully treated it was practically the only remedy used (Cassonte); is almost specific in this disease (A. H. Smith); preferred to the salicylates after the stage of congestion, in feeble cases and when cardiac lesions exist (Bridges). **Sodium Salicylate**, in large doses, not less than ʒij daily, proved curative in 72 consecutive cases (Liegel); has antibacterial power in pneumonia (A. H. Smith). **Strychnine Sulphate**, in addition to guaiacol or the salicylate, to obviate cardiac depression, also for its action on the nervous system (Bridges); in a full dose hypodermically, repeated if necessary, for impending cardiac failure; is more useful in 1 or 2 full doses than in smaller doses more frequently (Pye-Smith); gr. $\frac{1}{30}$ every 3 or 4 hours with free use of alcohol, the uniform treatment in the U. S. Navy, and to it the Surgeon-General attributes the unusually low percentage of mortality for 1896–97 in his service from this disease. **Quinine** or **Salicylic Acid**, to reduce temperature (R); Quinine as a tonic in cases which are asthenic from the first (P); in conjunction with Aconite and Veratrum, gr. viij–xij daily at start, is beneficial (Da C). **Antipyrin**, to reduce pyrexia; is decidedly more serviceable in pneumonia than Quinine (Wa); gr. xv several times a day, or 3 hourly doses each of gr. xxx, then stopping until temperature rises again (R); such doses are too high and are dangerous [see page 170]; with Camphor internally, successful in all of 22 cases of croupous pneumonia so treated at the Lom Hospital, in 1894, Antipyrin gr. viij, Camphor gr. ij, Morphine Hydrochlorate gr. $\frac{1}{12}$, in powder every one or two hours (Ivanoff). **Camphor**, in olive oil, in doses of from gr. j to gr. ij three or four times a day, hypodermically, in adynamic cases, used simultaneously with the above antipyrin and camphor powder (Id); in fibrinous pneumonia these injections lower the temperature about a degree and ameliorate the general condition. **Ammonium Carbonate**, at crisis for depression; in infusion of Senega (B) [or the formula on next page]; is useful late in disease when lung tissue breaks down (Da C). **Ammonia**, the Aromatic Spirit as a substitute for the Carbonate, in doses of ʒss in simple elixir (Da C). **Turpentine**, as stimulant at crisis (B). **Serpentaria**, with Ammonium Carbonate in low types, as a stimulant about the crisis. **Digitalis**, of doubtful value; may be useful for high temperature, ischemia, and low tension of vessels (B); as case goes on and circulation is to be further controlled, Digitalis is indicated (Da C); the best agent to slow the heart in infantile pneumonia, with Belladonna as an adjuvant (Brown). **Bryonia**, when pleural complications (P). **Phosphorus**, especially when typhoid symptoms; approved by Fleischmann (R). **Belladonna** is useful in the first stage (P); Harley esteemed it highly in pneumonia (Wa); as an adjuvant to Digitalis in infantile pneumonia, to soothe the irritable nervous system and curtail super-abundant secretion (Brown). **Tartar Emetic,** formerly given in large doses; now abandoned; small doses may be useful, but should be used with care lest depression ensue (B); at commencement with alcoholic stimulants, if patient weak (R); may benefit young, robust subjects (Wa). [See under PLEURITIS.] **Sanguinaria,** as a contra-stimulant, when fever has abated, and graver symptoms have amended (P). **Iodides,** no remedy more efficient; Ammonium Iodide with Arsenic, to prevent caseation of inflammatory products (R); Ethyl Iodide, gtt. v–xx ter die by inhalation, very valuable in catarrhal form (B); Sodium Iodide is useful in catarrhal pneumonia (Da C). **Ipecacuanha,** the wine in infantile pneumonia, should never be dispensed with, as it promotes expectoration, controls hemorrhage and regulates secretion (Brown). **Senega,** in advanced stages as expectorant, when cough is dry, irritating and painful, tightness and oppression of chest (P). **Opium,** or Morphine by injection, sometimes needed for severe pain (R); Opium is very desirable in many cases, relieves the symptoms and arrests delirium (Wa). **Copper Acetate,** Kissel regards it curative; under it the mortality was only $4\frac{3}{10}$ per cent. **Stimulants,** in asthenic cases, those of malignant type, and those occurring in aged people (Wa). **Blisters,** useful at very beginning only, or at crisis of disease, harmful in inflammatory stage (B); to lessen the pain, but should be used in moderation (R). **Wet-pack,** hot, tightly pinned to limit motion of chest-walls (B). **Poultices,** encircling the whole chest in children (R). **Glycerin,** in the form of *Unna's Paste* (see page 329), or in the application called *Antiphlogistine,* makes an excellent poultice and fulfils many indications in pneumonia. **Diet,** farinaceous, mucilaginous drinks, and rest in warm room (R). [Compare PLEURO-PNEUMONIA.]

℞. Tinct. Veratri Viridis, . ♏xl.
Spt. Ætheris Nitrosi, . . ʒvj.
Liq. Potassii Citratis, . ʒivss.
Syr. Zingiberis, q. s. *ad* ℥vj.
M. Sig.—A tablesp. every 3 hours, in the early stage. (*Da Costa.*)

℞. Ammonii Carbonat., . . gr. xl.
Infusi Serpentariæ, . . . ℥iv.
M. Sig.—A teasp. every 3 hours, as a stimulant about the crisis. (*B.*)

℞. Sodii Iodidi, ... ʒiij.
Morphinæ Sulph., . . . gr. j.
Elixir Simplicis, ... ℥iv.
M. Sig.—A teasp. ter die, also blisters over the apex. In catarrhal pneumonia. (*Da C.*)

℞. Ammonii Iodidi, . . . gr. xl.
Spt. Ammoniæ Aromat., ʒij.
Elix. Simp. et Aquæ, *ad* ℥viij.
M. Sig.—Two tablesp. thrice daily. In syphilitic lobar pneumonia. (*Da C.*)

Poisoning.

A Poison, in the medical and toxicological sense, is any substance of inherent deleterious character and incapable of self-reproduction, which, acting chemically or physiologically upon the tissues or fluids of the body, will seriously injure the health or destroy life.

The most energetic poisons are Hydrocyanic Acid, Potassium Cyanide, Nicotine, Strychnine, Carbolic Acid and some reptile venoms. The poisons usually selected by poisoners for criminal purposes on others are those which produce effects resembling the symptoms of natural disease, as Arsenic, Colchicine, Tartar Emetic, Strychnine, Morphine and Aconite. Those generally chosen for suicidal purposes are such as may be most readily obtained by the laity, namely—Carbolic Acid, Morphine, Illuminating gas, Charcoal gas and Potassium Cyanide; the first being easily purchased for disinfecting purposes, while the last is commonly used in the arts. In 2,097 cases of death from poison in England and Wales, from 1863 to 1867, there were 628 due to Opium and its preparations, 151 to Hydrocyanic Acid and Potassium Cyanide, 83 to Arsenic, 77 to Mineral Acids, 66 to Oxalic Acid, 61 to Strychnine, 58 to Mercurial compounds, 15 to Phosphorus and 11 to Ammonia.

General Principles of Treatment. The following Rules are laid down by high authority: (1) Lose no time. (2) Use the best remedy obtainable at once. (3) Get rid of the poison. (4) Stop its action. (5) Remedy the mischief already done. (6) Fight against the tendency to death (Tanner). In the treatment of poisoning, whether by mineral or vegetable substances, if the poison is known the first indication is to administer the proper chemical *Antidote*, so as to render it harmless or comparatively so. Next, the stomach should be emptied and washed out, lest the newly-formed compound be absorbed after a time, also to remove any poison which may have escaped the action of the antidote. Next, the appropriate *Antagonist* should be administered, to counteract the effects of such portion of the poison as may have been absorbed. Lastly, such *Antagonistic Measures* should be employed as may sustain the action of any organic function showing signs of failure. In most cases of alkaloidal poisoning absorption has proceeded so far before professional assistance is obtained that antidotes are of no value, hence reliance can be placed only upon the physiological antagonist and such supporting measures as will tend to maintain vitality until the poison can be eliminated by the natural channels.

Antidotes affect a poison, either physically or chemically or both, so as to remove it from the body or alter its character before absorption, and thereby prevent its toxic action upon the organism. They do their work in the alimentary canal or in the respiratory passages, and are applicable to vegetable as well as mineral poisons, but they are not available against poisons administered hypodermically. [See page 36.] Among them are Emetics, Cathartics, Washes, Injections, Ligatures, Poultices, the use of the Stomach-pump, of tourniquets, etc., which are termed *Mechanical Antidotes;* and the *Chemical* or *True Antidotes*, which include Albumin, Milk, Charcoal, Soap, Starch, Oils, Tannin, Turpentine, Acids, Alkalies, Potassium Permanganate, Carbonates, Hydrates, Sulphates, Sodium Chloride, Iodine, Iron preparations, etc.

Antagonists are agents which oppose each other in their physiological action, and may be employed against each other as counterpoisons, to neutralize their effects upon the organism. They do their work in the blood and tissues, after absorption, and are especially available against poisons administered hypodermically, in which cases antidotes are useless. *Substances* so employed are generally the active principles of plants, a few being chemicals, as Oxygen and Chloral. *Antagonistic Measures* include such proceedings as tend to neutralize the remote effects of poisons, as artificial respiration, faradism of the respiratory muscles, hot and cold applications, douching, constant motion or absolute repose, etc. (See page 33.)

Emetics, when employed, should be used without delay. They are often rendered needless by vomiting induced by the poison itself, or by the free use of diluent drinks; and are contraindicated when there is severe corrosion of the alimentary canal or when abdominal inflammation exists. The best emetics are: *Zinc Sulphate*, for stomachal administration, being non-nauseating, 20 to 30 grains in water, 5 grains for children. *Apomorphine*, gr. $\frac{1}{16}$–$\frac{1}{6}$, hypodermically, when narcosis prevents the use of emetics by the mouth. It should be administered hypodermically, as it is very uncertain in action when given otherwise. The following may be used:—Copper Sulphate, 1 to 5 grains in water; Ipecac, in powder; Emetine, gr. $\frac{1}{12}$ to $\frac{1}{3}$; Tartar Emetic, 1½ grains, acts slowly and is depressant; Turpeth Mineral; Cadmium Sulphate; Sodium Chloride (common salt), 2 teaspoonfuls in a pint of water; Mustard, 2 teaspoonfuls in a cup of warm water; also Olive Oil, Soap-suds, Snuff, melted Fats, and tickling the fauces with the finger or a feather. *Sodium Chloride*, as an emetic, is contraindicated in poisoning by tartar emetic or corrosive sublimate, and so also are Oils and Fats and substances containing them, in poisoning by phosphorus, cantharis, carbolic acid or copper salts.

Cathartics are generally employed after the use of a chemical antidote, to remove the compounds formed thereby from the intestinal canal. The best are Castor Oil, Croton Oil, Senna, and Magnesium Sulphate (Epsom salt).

Castor Oil protects the mucous membrane and obstructs absorption, but is contraindicated in poisoning by phosphorus, carbolic acid, copper salts, or cantharis, the absorption of which is aided by oils and fats. *Croton Oil* is rapid and powerful in the dose of from 1 to 5 minims, in a bread pill. *Magnesium Sulphate*, in the dose of 1 to 4 oz., well diluted, is of special service in chronic lead poisoning and to remove antidotal compounds from the intestines. Senna, Gamboge, and other drastics are the best cathartics in narcotic poisoning.

The Stomach Pump and **Stomach Siphon** are efficient, and do not weaken the patient as emetics do, but are not always available, and cannot be used when there is corrosion of the stomach or esophagus, for fear of perforation. The continuous or occasional washing of the stomach is a measure of great importance in the case of soluble poisons, some of which are excreted into the stomach [see *infra* under OPIUM]. These appliances are almost useless when the poison is in solid form and in large pieces (as meat, sausage, fish, cheese, etc.).

Albumin is an ideal chemical antidote, being harmless, easily procured, and forming compounds (which are more or less insoluble) with most of the metallic salts, corrosive alkalies and mineral acids, as also with Iodine, Bromine, Chlorine, Creosote, Anilin, and alcoholic solutions of most of the Alkaloids. It is especially suitable against inorganic poisons, and was recommended by Orfila for invariable use, even on the mere suspicion of poisoning. It should be well diluted, the whites of four eggs to a quart of lukewarm water; and should be followed by emetics and cathartics, as many of its compounds are soluble in an excess of itself.

Milk is a good substitute for Albumin, its antidotal action being nearly the same in range and due to its casein, albumin and free alkali. It is particularly valuable against metallic salts, corrosive acids and alkalies (especially Ammonia) and the alkaline earths, but it is contraindicated when fatty antidotes are to be avoided, by reason of its richness in fat.

Gelatin is of especial value against Iodine, Bromine and the Alums, but requires too much time for its preparation, as it should be broken up, soaked in water for half an hour and reduced to the consistency of honey.

Gluten is of value against Corrosive Sublimate, but is less so than albumin and is not easily obtained.

Tannin (Tannic Acid), precipitates the Alkaloids and their salts, with which it forms compounds (tannates), which, though comparatively insoluble are not entirely inactive, and should be removed at once from the alimentary canal by emetics and drastic purgatives. It acts well against many metallic salts, though inferior to albumin for these, except against Tartar Emetic, which albumin does not affect, but tannin renders harmless. It is given in doses of gr. xv to xlv, in a 2 per cent. solution, every ¼ hour; and if combined with about 10 per cent. of its weight of Iodine its antidotal effect on vegetable poisons is greatly increased. If not itself obtainable, decoctions or infusions of substances containing it may be used, as tea and coffee, nut-galls, kino, rhatany, catechu, and the barks of oak, willow and cinchona.

Oils and Fats are efficient against the corrosive acids and alkalies, the metallic oxides and salts; but are contraindicated in poisoning by Phosphorus, Cantharis, Carbolic Acid, or Copper salts, the absorption of which they promote. With the caustic alkalies they unite to form soaps, liberating glycerin; they are inferior to albumin against the metallic salts, and as their action is slow they are less efficient than acids against alkalies. Those used are olive, cotton-seed, linseed and almond oils, also melted butter and lard.

Starch, in paste, 1 to 15 of water, is the antidote for Iodine and Bromine, with which it forms compounds which are almost harmless. It has some value against Corrosive Acids, Corrosive Sublimate, and Zinc and Copper

Sulphates, but it is not so efficient as Albumin, which is preferred for these poisons as well as for Iodine, since it has a greater affinity than starch has therefor.

Soap, as Castile Soap, dissolved in 4 times its bulk of hot water, to make "suds," and given by the cupful, is one of the most efficient antidotes against corrosive acids and metallic salts, especially Corrosive Sublimate, Potassium Bichromate, and Salts of Tin and Zinc. It is inferior to albumin against these, but is preferred to caustic alkalies against acids, as of itself it has no corrosive action. It should not be used against alkalies.

Gum Arabic, in the form of mucilage, is chiefly used as a protective against corrosive poisons, and has been recommended in copious draughts against poisoning with the Bismuth salts.

Charcoal has some antidotal value against many alkaloids, the metallic salts, and Phosphorus, slowing their toxic action and postponing their effects, probably by a protective action upon the gastric walls. It has the valuable property of absorbing gases, but enters into no fixed compound with any mineral or vegetable poison. Fresh animal charcoal is the best, though wood charcoal is efficient, but in less degree.

Oil of Turpentine, after long exposure to the air, therefore containing much oxygen, is one of the antidotes against Phosphorus. It should be administered immediately after the ingestion of that poison, alone or in hot water, and in quantity 100 times that of the phosphorus supposed to be present.

Organic Acids, such as Acetic (vinegar), Citric (lemon-juice), and Tartaric are employed against the Alkalies and alkaline Carbonates.

Inorganic Acids.—Diluted Sulphuric Acid, in water, is used against the soluble salts of Barium and Lead, with which it forms insoluble sulphates; also as a prophylactic against the colic of lead poisoning.

Ammonia, diluted, used by inhalation, is an efficient antidote against the vapors of corrosive acids and Nitrobenzol, also against Chlorine, Bromine, and Hydrocyanic Acid.

Magnesium Hydrate and Carbonate are the most efficient antidotes against Acids and the acid salts, also against Oxalic Acid and the acid oxalates, in the absence of the calcium antidotes therefor. They are also valuable against Arsenic, Phosphorus, Mercury, Corrosive Sublimate and other metallic salts, forming with arsenic compounds which are almost insoluble, and with metallic salts in solution precipitating the corresponding oxides or basic salts.

Magnesia is a compound of the Hydrate and Carbonate of Magnesium with water, or a basic Magnesium Carbonate. When heated at a low temperature it becomes calcined, losing CO_2 and H_2O; then mixed with 25 times its weight of warm water it becomes gelatinized, in which condition it is best for antidotal purposes, in doses of from 1½ to 2 oz., at short intervals for a few doses, then at longer intervals. An excess does no harm, but rather benefits the patient by its cathartic action.

Carbonates and Bicarbonates of Sodium and Potassium are employed against most of the poisonous metallic salts, especially those of Zinc, which they immediately decompose, forming insoluble basic compounds; also against Iodine, Bromine, and Potassium Bichromate, forming the neutral chromate with the latter and harmless salts with the former. They are useful in dilute solution against Acids, but are less easily tolerated than magnesium sulphate. They are contraindicated in poisoning by Oxalic Acid, with which they form dangerous compounds.

Calcium Hydrate and Carbonate, in the form of lime-water, chalk, eggshells or powdered oyster-shells, are used against Acids, both mineral and organic, and especially against Oxalic Acid and the acid oxalates, which they neutralize and convert into the insoluble calcium oxalate.

Sulphates of Magnesium and Sodium (Epsom and Glauber's salts), the soluble sulphates, are particularly efficient against Carbolic Acid and the salts of Barium and Lead.

Sodium Chloride (Common Salt), in dilute solution, is the best antidote against the Silver salts, converting them into the insoluble chloride of silver. It may be given with albumin, which is also a very efficient antidote in this form of poisoning.

Potassium Ferrocyanide, given in doses of 30 to 60 grains in water, is of special value against the Copper salts, but albumin is equally efficient and more easily obtained.

Potassium Permanganate, is the best antidote against all organic poisons, if used promptly, before absorption has taken place, as it rapidly destroys them by oxidation. It has been used successfully against Morphine and Strychnine salts and Phosphorus in the stomach, and locally for snake-poison.

Iron.—The **Hydrated Sesquioxide** is the best antidote to Arsenic in solution or in a soluble form, as it combines with the latter to form a ferrous arsenate, and also protects the gastro-intestinal mucous membrane against the local action of the poison. In the proportion of 10 parts to one of arsenic the union is very complete, but its union with the salts of arsenic is limited even when it is in great excess, though much more effectual if there is added to it a small amount of ammonia or other caustic alkali, or if the basic ferric acetate is mixed with it. For the preparation of the official arsenic antidote see *Ferrum Oxidum Hydratum cum Magnesia*, under the title Ferrum in Part I. Dialyzed Iron, Saccharated Iron, and the basic Ferric Acetate have all been used with more or less success in arsenic poisoning.

Copper Carbonate, in dose of 3 to 6 grains, with sugar and water, preceded and followed by an emetic, is recommended in phosphorus poisoning, being supposed to coat the particles of Phosphorus first with a layer of copper phosphide and then with one of copper itself, thus preventing their solution in the fluids of the stomach.

Sodium Hyposulphite, in doses of 15 grains, in very dilute solution and frequently repeated, is a valuable antidote against Bleaching Powder (Calcium Hypochlorite), Labarraque's solution (Sodium Hypochlorite), and Javelle Water (Potassium Hypochlorite), which it reduces to chlorides, itself undergoing oxidation to the sulphate.

Chlorine, in the form of Chlorine Water, Labarraque's solution, or Javelle Water (see above), is employed externally as an antidotal wash for snake-bites and other poisoned wounds; also, well diluted, internally against alkaloids and other vegetable and animal poisons; and as a spray for antidotal inhalation against coal gas (Carbonic Oxide), Ammonia, Phosphoretted and Sulphuretted Hydrogen, also Hydrocyanic Acid.

Iodine, in very dilute solution, is used as an antidote against alkaloids and their salts, other vegetable poisons and snake-venom. All its compounds are more or less soluble and toxic, and must therefore be removed from the system as soon as possible. *Bouchardat's Antidote for vegetable poisons* consists of 3 grains of Iodine, 30 grains of Potassium Iodide, and 11 oz. of distilled water. The dose, which is from 1½ to 3 oz., should be repeated frequently.

Ammonium Carbonate, in dose of 5 grains, administered hypodermically in the vicinity of wounds caused by poisoned arrows, was repeatedly used by Dr. Parke, the surgeon of Stanley's last expedition in Africa, with entire success in saving life when it was employed immediately after the injury. Persons so wounded, if they were at too great a distance to receive this treatment, invariably died within a short time.

Antidote Bag, designed by Martindale, of London, contains the following-named articles, labeled with directions for use, viz.—

Dialyzed Iron.
Syrup of Chloral.
Chloroform.
Spt. Chloroformi.
Calcined Magnesia.
Spt. Ammoniæ Aromat.
Oil of Turpentine.
Acetic Acid.
Tincture of Digitalis.
Tannic Acid.
Amyl Nitrite.
Zinc Sulphate.
Ipecacuanha.
Potassium Bromide.
Potassium Permanganate.

Also a Hypodermic Syringe and Solutions or Pellets therefor of—

Morphine Sulphate.
Atropine Sulphate.
Apomorphine Hydrochlorate.
Pilocarpine Nitrate.
Strychnine Nitrate.

General Antidotes have been devised for use when the nature of a poison is unknown, with the object of a "shot-gun prescription," intended to hit something. One of the best is *Jeaunel's*, composed as follows,—Liquor Ferri Sulphatis (sp. gr. 1.45) ℥ijss, Magnesia Calcinat. ℥ij, Carbo Animalis ℥j, Aqua ℥xx. These ingredients should be kept separate—the solution of the sulphate in one vessel, the others together. When needed, the former should be added to the latter and violently agitated. Dose, ℥jss to ℥iij. This is a perfect antidote for Arsenic, Zinc, Digitalin, etc. It delays the action of the salts of Copper, Morphine and Strychnine, and slightly influences compounds of Mercury. It is valueless for Cyanide of Mercury, Tartar Emetic, Hydrocyanic Acid, Phosphorus, or the caustic Alkalies. *Bouchardat's Antidote* is described on the previous page, under IODINE. *Bellini* considers the Iodide of Starch a valuable antidote to alkaline Sulphides, earthy Sulphides, vegetable and caustic Alkalies, and Ammonia. In the first two cases he considers it superior to all other antidotes.

A fresh mixture of the Sulphides of Iron and Sodium with Magnesia, is said to be a perfect antidote for Copper salts, Corrosive Sublimate and Mercuric Cyanide. If the nature of the poison is entirely unknown, a harmless yet effectual antidote in most cases is one composed of equal parts of Magnesia, Wood Charcoal, and the Hydrated Ferric Oxide, given freely in plenty of water.

Poisoning by

Acetanilid. ANTAGONISTS,—*Belladonna* or *Atropine*, to maintain the blood-pressure; *Strychnine*, for the respiration; *Oxygen* inhalations, to overcome cyanosis; *Heat*, externally applied. Stimulants and supporting measures.

Acids. ANTIDOTES,—*Alkalies* for the least irritant acids, *Magnesia*, Magnesium Oxide, slaked Lime, Chalk; plaster from wall with water, milk, oil, white of egg, bland mucilaginous drinks and poultices (R). ANTAGONISTS,—See under Acids, Mineral, on the next page.

Acid, Acetic. ANTIDOTES,—*Magnesia* or Magnesium Carbonate, freely; Soap and water, Lime-water, Chalk, White-wash; also milk, oils and thick gruel may be given. ANTAGONISTS,—*Morphine*, gr. ¼, to ward off shock.

Acid, Carbolic. ANTIDOTES,—Any soluble *Sulphate* to form a sulpho-carbolate, as Magnesium or Sodium Sulphate (Epsom or Glauber's salts). In a case where ½ oz. of 95 per cent. carbolic acid had been taken, nearly 3 ozs. of Magnesium Sulphate were used, resulting in full recovery from an apparently hopeless condition. *Alcohol*, is a perfect antidote to the corrosive effects of carbolic acid (Phelps). The routine practice in one emergency hospital is to wash out the stomach with alcohol and water, equal parts of each, and then to leave in the stomach about ℥viij or ℥x of the same mixture. This treatment has proved very efficient in a number of cases. *Liquor Calcis Saccharatus*, or the official *Syrupus Calcis*, given freely. *Soap*, in strong watery mixture (suds), is said to be almost a perfect antidote. *Cider Vinegar* may prove antidotal, as it removes the effects of the strong carbolic acid applied locally. *Vegetable Demulcents* (but no oils or glycerin), to protect the mucous surface. *Sodium Carbonate*, in strong solution locally, for the effects of its local use in excess; this also as a wash for the mouth, if necessary. ANTAGONISTS.—*Atropine* is a very complete antagonist to the systemic symptoms, maintaining the heart and respiration until elimination occurs: gr. $\frac{1}{60}$ hypodermically. *Amyl Nitrite*, by inhalation, *Alcoholic* stimulants freely. *Heat* to the extremities, also Faradism and friction thereof. *Venesection* in desperate cases (Murrell).

Acid, Carbonic (Carbon Dioxide). See *ante*, page 92, also under Illuminating Gas, below, for the treatment of poisoning by Carbonic Acid and Carbonic Oxide gases.

Acid, Hydrocyanic (Prussic). Forty minims of the official diluted acid have proved a fatal dose. ANTIDOTES,—if time to do anything, *Cobaltous Nitrate* has proved a perfect antidote in over 40 cases (Antal). *Ammonia*, diluted, by inhalation, or Chlorine Water by spray, for the vapor. Per- and Proto-salts of Iron with Magnesia. Calcium or Sodium Chloride, gr. xxx–xl, in water. Sodium Thiosulphate. Use emetics or the stomach-pump. ANTAGONISTS,—*Stimulants*, as Brandy, Chloric Ether, Ammonia, ad libitum. Alternate hot and cold Douche, from a height. *Artificial Respiration*, the faradic current (mild) to chest walls and over cardiac region. Atropine has antagonistic action, but is too slowly diffused to be of any value. *Ammonia* by inhalation, by the stomach, and by intra-venous injection, with cold affusion to the spine, and artificial respiration, are the measures most likely to avail in cases where there is time to do anything.

Acids, Mineral. ANTIDOTES,—*Alkalies*, as Sodium Carbonate or Bicarbonate, Magnesia, or Chalk, Soap, Whiting, Wall-plaster, in water. *Albumin*, Flour, Milk, Starch, Olive Oil, to protect the mucous membrane. Avoid water in Sulphuric Acid cases. ANTAGONISTS,—*Opium*, Ammonia (intra-venously), Alcohol, as stimulants, to combat the depression of the vital powers.

Acid, Oxalic, also the Acid Oxalates, as Potassium Oxalate, known as "Salts of Lemon," or of "Sorrel," used for removing ink-stains. ANTIDOTES,—*Calcium Carbonate* or *Hydrate* (as lime-water, chalk, whiting, wall-plaster, in water), or Magnesia. Avoid Potassium and Sodium Carbonates and Bicarbonates. Bland mucilaginous drinks and poultices to the abdomen.

Aconite. ANTIDOTES,—*Tannic Acid*, or Animal Charcoal, powdered, in water. Emetics or the stomach-pump. Castor Oil, or other purgatives. Bland fluids, and poultices for abdominal irritation. ANTAGONISTS,—*Atropine*, Caffeine, Morphine, Ether, Ammonia, Amyl Nitrite, antagonize its effects on the heart and respiration. *Digitalis* antagonizes its action on the heart and its relaxation of cardiac inhibition (Fothergill). In Aconite-poisoning the stomach should be evacuated, warmth applied to the extremities, stimulants administered, artificial respiration if necessary, and the recumbent posture strictly maintained. *Caffeine* may be administered hypodermically, and strong Coffee by the mouth.

Alcohol. ANTIDOTES,—*Emetics* or the stomach-pump, if much alcohol recently swallowed. ANTAGONISTS,—*Ammonia* by inhalation cautiously. Cold affusion to the head. Warmth to the extremities. Faradism of the muscles of respiration. Artificial Respiration. *Chloral*, gr. xx–xxx every 4 hours to secure sleep. *Bromides* for the same purpose, or Capsicum in doses of gr. xx–xxx. *Ammonium Chloride*, about ʒss in half a pint of water at one draught, has a marvelous effect in generally straightening up the victim, antagonizing stupor and restoring faculties. *Hyoscine* or *Duboisine*, as hypnotic, gr. $\frac{1}{100}$–$\frac{1}{80}$ hypodermically. [Compare the titles Alcoholism and Delirium Tremens in Part III, also pages 137, 138, *ante*.]

Alkalies. ANTIDOTES,—*Acids*, diluted, especially the vegetable acids, as Vinegar, Lemon-juice, etc. *Albumin*, Milk, Gelatin. *Oils* to protect the mucous surfaces. [Compare Ammonia below.] ANTAGONISTS,—Opium for the shock and vital depression, also Caffeine, Alcohol, and other stimulants.

Alkaloids. ANTIDOTES,—*Tannin* holds high rank, forming tannates, which are comparatively insoluble. *Potassium Permanganate* (see *ante*, page 376). *Albumin.* Iodine. Charcoal. Emetics and cathartics afterwards. ANTAGONISTS,—differ for each. [See their several titles in this section.]

Alum. ANTIDOTES,—*Carbonates* of Ammonium, Potassium, etc. Other treatment as for corrosive salts. [See Metallic Salts, page 814.]

Ammonia. *Sources of Danger*, the use of Smelling Salts or Spirit of Hartshorn in excess, and the strong solution of Ammonia kept by housekeepers for laundry purposes. ANTIDOTES,—Vinegar, Lemon- or Orange-juice, any *Vegetable Acid*, followed by demulcents to protect the mucous surfaces. When inhaled, give vapor of Acetic or Hydrochloric Acids or Chlorine-water by inhalation, the two latter forming the chloride. ANTAGONISTS,—*Aconite*, Veratrum, Digitalis, as cardiac sedatives.

Amyl Nitrite. ANTAGONISTS,—*Ergotin*, *Atropine*, *Strychnine*, also Brucine, Digitalis, Picrotoxin, and all other agents which increase the functional activity of the spinal cord and sympathetic, are antagonistic, though not always available by reason of their slower rate of diffusion. *Stimulants*, artificial respiration, the alternate cold and hot douche, with cold to the head, and *Ergotin* or *Atropine* hypodermically, are the best measures to be used in cases of poisoning by the Nitrites.

Anesthetics (Ether, Chloroform, etc., by inhalation). ANTAGONISTS,—*Atropine*, hypodermically, is of great value in combating the cardiac and respiratory failure of ether (Amidon); and is equally efficient in chloroform poisoning, as I have found by experience (Potter). *Strychnine*, hypodermically, has done good service in chloroform narcosis and has many advocates. *Amyl Nitrite*, by inhalation. *Oxygen*, by inhalation. *Venesection*, to relieve the engorged right heart, supplemented by *Galvanism* to stimulate the cardiac action (Spooner). *Artificial Respiration*, Fresh Air, Coffee. Faradism of the respiratory muscles. *Heat* applied to the body and limbs. Ice in the rectum, *Ammonia*, 10 minims of the Liquor in 40 of water, intravenously,—unsuccessful (Bartholow). Invert the patient, draw the tongue well forward with forceps, compress and relax the chest, maintain the inverted position until the pulse and respiration are good (Nélaton).

Antimony (as Tartar Emetic, etc.). ANTIDOTES,—*Tannin*, or any substance containing it, is the antidote, forming the insoluble tannate. *Albumin* or Milk. *Carbonates* of Magnesium and Sodium. *Magnesia*, in milk, especially for the chloride of antimony. Alkalies and Salts of Lead decompose tartar emetic. Emesis by tickling the fauces. Demulcent drinks freely, to protect the mucous membranes. Water, warm, in large draughts; or lavage of the stomach with water first, then with a solution of Tannin. ANTAGONISTS,—*Opium*, Alcohol, Ether, and other antispasmodics.

Antipyrin. See *ante*, under Acetanilid, for the treatment of poisoning by Antipyrin, Phenacetin, Kairin, and similar compounds.

Arsenic (Arsenous Acid). Two grains have been fatal. *Common Sources of Danger:* arsenical wall-papers, Arsenic mistaken for "salts" or for "magnesia," adulterated confectionary, also Paris Green (Cupric Aceto-Arsenite) taken with suicidal intent. ANTIDOTES,—*Hydrated Ferric Oxide*, freshly prepared by precipitating a solution of Ferric Chloride with Sodium Carbonate or Ammonia,—or as the official *Ferri Oxidum Hydratum cum Magnesia* (see *ante*, page 317), in the proportion of gr. viij for each grain of the poison ingested. *Dialyzed Iron*, is quite efficient as an antidote, is more easily obtained than the hydrated oxide, and has rendered good service in many cases of poisoning from inhaling arsenical fumes. *Ferri Subcarbonas* is equally good, ℥ij followed by Castor Oil (Leale); or Hydrated Magnesia, or Magnesia and Sugar (Carl). *Magnesium Bicarbonate* or other alkalies (R). *Charcoal*, ℥ss or more (R). Saccharated Ferric Oxide. Basic Ferric Acetate. *Apomorphine*, hypodermically, or Zinc Sulphate, as an emetic (avoid Tartar Emetic). Emesis by feather-tickling. Oil and Lime-water mixed, before and after emesis (Taylor). Milk or other bland fluids to wash stomach. Castor Oil after emesis. Magnesia and Linseed tea. Poultices and fomentations over abdomen. *Potassium Iodide* afterwards to promote elimination. Antagonists,—None.

Barium Salts. Antidotes,—*Sulphates* of Magnesium and Sodium (Epsom and Glauber's salts), of Calcium or Potassium. Diluted Sulphuric Acid.

Bee and Insect Venom. Antidotes,—*Aqua Ammoniæ*, Sodium Bicarbonate or Chloride, or Carbolic Acid, applied to the wound; or ♏xv of a 2 per cent. solution of the first hypodermically, with Liquor Ammonii Acetatis internally. [Compare the article on Stings in Part III.]

Belladonna and Atropine. Antidotes,—*Tannin*, Zinc Sulphate or Apomorphine, as emetics, or the Stomach-pump. Purgation. *Magnesium Bicarbonate*, and other alkalies (R). *Charcoal*, ℥ss or more is necessary (R). Antagonists,—*Morphine* is the physiological antagonist to the effects of Atropine on the cerebrum, pupils, heart, respiration, arterial tension and kidneys; *Aconite*, Physostigmine, Pilocarpine and Quinine are each antagonistic to some of its effects, *Muscarine* to most of them. Brandy or strong Coffee. Capsicum. Faradism of respiratory muscles. Flagellation. Cold to the head. Ammonia, the vapor inhaled into air-passages (R).

Bromides. Antidotes,—*Nitrous Ether* is incompatible with Ammonium Bromide, Acids and Metallic Salts are so with all the bromides. Poisoning thereby is always chronic, never acute, hence no antidotes can be employed. Antagonists,—*Morphine* is the most efficient, especially for the mental symptoms. *Digitalis*, Ergot, Belladonna, and other vaso-motor stimulants, antagonize many of the effects of the bromides. *Cocaine* is useful in chronic depressant poisoning thereby, and Alcohol with Opium as a nervous stimulant.

Bromine. Antidotes,—*Albumin*, Starch, Gelatin, Sodium and Potassium Carbonates and Bicarbonates. Against the irritant vapor, *Ammonia* vapor by inhalation, or steam inhalations. Antagonists,—*Opium* and Alcohol as stimulants, if much depression ensues.

Calcium Chloride. Antidotes,—*Albumin*, Mucilaginous drinks, or Oils, Milk, Flour and water. Avoid acids. Antagonists,—*Opium*, Alcohol, for vital depression.

Camphor. Antidotes,—*Water* to precipitate it from the alcoholic solution. *Alkalies* and earthy salts precipitate even the small quantity which is soluble in water. Emetics to remove as much as possible. Antagonists,—*Aconite* and other arterial sedatives. Coffee. Cold. Alcoholic stimulants. *Opium* and Bromides for the convulsions.

Cannabis Indica. Antidotes,—*Emetics* to remove as much as possible. Antagonists,—*Alcohol*, as stimulant. *Strychnine* as respiratory stimulant. Faradism of muscles of respiration. *Lemon-juice* is said to antagonize its effects, which last over 24 hours from a large dose.

Cantharis. Avoid Oils, also fats and milk, which promote its absorption. Antidotes,—Emetics. Demulcents (as linseed tea, gruel, barley-water), freely. Water in large quantities, to flush the kidneys. Oleaginous injections into the bladder to allay irritation. There is no chemical antidote. Antagonists,—None, but *Opium* may be given for the gastro-enteritis.

Carbonic Oxide. See page 813, under Illuminating-gas, for the treatment of poisoning by Carbonic Oxide and Carbonic Acid gases.

Chloral Hydrate. Antidotes,—*Liquor Potassæ*, in hourly doses of ʒij well diluted, which amount will decompose 20 grains of chloral each time in the blood (Dougall). *Emetics*, or the stomach-pump, if patient is seen shortly after ingestion of a toxic dose. Reliance must generally be placed on the antagonism of the following. ANTAGONISTS,—*Strychnine*, but only to a limited extent; though Chloral is the most perfect antagonist to strychnine, opposing its spinal action (but see page 257). *Heat* to the body and limbs, by hot blankets, hot water bottles, etc., is the most efficient antagonist. *Atropine* antagonizes its cardiac, respiratory and spinal depression, and should be used hypodermically, in small doses (gr. $\frac{1}{200}$), frequently repeated, until its effects are apparent. *Morphine* administered with chloral antagonizes its tendency to produce cardiac failure, while synergistic to the hypnotic action of the drug. *Cocaine* is of value for the cardiac and respiratory depression. Alcoholic stimulation. Amyl Nitrite by inhalation. Frictions. Coffee, black, a pint injected into the rectum, as for narcotic poisoning. Artificial respiration.

Chlorine. ANTIDOTES,—*Albumin* for chlorine preparations in the stomach, also Aqua Ammoniæ in small quantity, well diluted. *Ammonia* vapor inhaled against chlorine inhalations, forming ammonium chloride. Ammonium Sulphide has similar reaction, but should be used in great moderation. Fresh air. Steam inhalations. Emesis with warm water, then white of egg or milk, flour, or lime-water. ANTAGONISTS,—*Chloroform* by inhalation, to ease the cough.

Chloroform (swallowed). Recovery has occurred after the ingestion of one, two and even three ounces of chloroform (H. C. Wood). ANTIDOTES,—*Sodium Carbonate* in plenty of water. Emetics. Treatment as for irritant poisoning. ANTAGONISTS,—*Atropine* or Strychnine, hypodermically. *Amyl Nitrite*, by inhalation. *Coffee*, black, a pint into the rectum. *Heat* to the body and especially to the cardiac region. Rouse by slapping with wet towel. Mustard to calves of legs and over the heart. Relapse may occur, hence the patient should not be left for some time after apparent restoration.

Cocaine. ANTIDOTES,—See under Alkaloids, above. ANTAGONISTS,—*Chloral* is the most direct antagonist, so also are Chloroform and Ether. *Morphine* is directly antagonistic at almost all points of action. *Amyl Nitrite* combats the earliest symptoms of cardiac depression, then Alcohol and Opium as cardiac stimulants. *Artificial Respiration* may be required.

Colchicum. ANTIDOTES,—*Tannic* or *Gallic Acid*, followed by emetics and cathartics. Demulcent drinks, warm. ANTAGONISTS,—Alcoholic stimulants. *Morphine*, hypodermically for the cardiac depression. Treatment is the same as that for Aconite poisoning.

Conium. ANTIDOTES,—*Tannic* or *Gallic Acid*, followed by emetics and cathartics. ANTAGONISTS,—*Nux Vomica* and its alkaloids, also Picrotoxin and other tetanizers. Alcohol. Muscular Movement. *Heat* applied externally, as soon as the stomach has been evacuated.

Copper Salts. ANTIDOTES,—*Albumin*, Soap, Gluten, Milk, Sugar, Magnesia. *Potassium Ferrocyanide*, is the most efficient chemical antidote, but Magnesia or Albumin may be used. In the absence of eggs, give a thin paste of flour and water. Any antidote should be followed by prompt evacuation of the stomach, and Potassium Iodide to saturation of the system. ANTAGONISTS,—*Opium* and Demulcents for the gastro-enteritis.

Corrosive Sublimate (Corrosive Mercuric Chloride). ANTIDOTES,—Albumin, Gluten, Magnesia, Milk, Lime-water. *Albumin*, in some form, is the most efficient; the white of one egg to each 4 grains of the poison, forms the albuminate, which must be at once evacuated by emesis or the stomach-pump, it being soluble in an excess of albumin, also in the alkaline contents of the intestines. *Potassium Iodide* for after-treatment, converts the poison into soluble combinations and promotes their elimination. *Charcoal*, ℥ss or more necessary (R). *Hydrated Protosulphide of Iron*, if given within 20 minutes, is said to be an efficient antidote. ANTAGONISTS,—See under Mercury, page 814. FATAL DOSE,—gr. iij have proved fatal.

Creosote. ANTIDOTES,—*Mucilage*, Oils, are the most easily obtained. ANTAGONISTS,—*Ammonia*, for depression. Treatment is the same as for Acid, Carbolic, which see.

Curare. ANTIDOTES,—Ligate above the wound, if any; incise the part freely and suck it strongly. Evacuation of the bladder repeatedly, to prevent reabsorption. *Caustic Alkalies* destroy the poison. ANTAGONISTS,—*Artificial Respiration* is the most efficient antagonist, maintaining life until elimination occurs. *Strychnine*, though from a member of the same family of plants, is antagonistic as to its action upon the heart and respiration. So also is Atropine.

Cyanide of Potassium. ANTIDOTE,—*Ferrous Sulphate* to form Prussian Blue (Ferric Ferrocyanide), followed by evacuation of the stomach. Ferrous Sulphate is a theoretical antidote, but is said to be practically worthless. *Cobaltous Nitrate*, is a perfect antidote (Antal). Sodium Thiosulphate. ANTAGONISTS,—*Ammonia*, intravenously. *Digitalin*, Strychnine, Alcohol. *Artificial Respiration*, general friction and galvanism. [Compare Acid, Hydrocyanic, page 809.]

Digitalis. ANTIDOTE,—*Tannic Acid*, to form the tannate, which, however, is not inert, so that the stomach should be immediately evacuated. ANTAGONISTS,—*Aconite* for the effects of large doses, *Opium* for those due to its continued use. *Saponin* and Senegin are its most complete physiological antagonists. Alcohol, Galvanism, Horizontal posture. The treatment is similar to that for Aconite.

Ergot. ANTIDOTE,—*Tannic Acid*, followed by an emetic. ANTAGONISTS,—*Amyl Nitrite*, Aconite, Veratrum Viride, Tobacco and Lobelia, antagonize its action on the circulation.

Fish-poison. ANTIDOTES,—Emetics and Cathartics. ANTAGONISTS,—*Potassium Chlorate* freely, Liquor Ammonii Acetatis, Opium, Capsicum, Chloroform.

Fungi, Poisonous. ANTAGONIST,—*Atropine*, is practically specific as an antagonist in many cases of fungi poisoning. [Compare Muscarine, page 815.]

Gamboge. ANTIDOTES,—Potassium or Sodium Carbonates. *Magnesia* in milk. Emetics. Mucilaginous drinks. ANTAGONISTS,—*Opium* for the depression. Alcoholic stimulants.

Gases and Vapors. See Ammonia, Acid Hydrocyanic, Chlorine, Illuminating-gas, Nitrous Oxide Gas, Sulphur.

Gelsemium. ANTIDOTE,—*Tannic Acid*, followed by an emetic or the stomach-pump, if recent. ANTAGONISTS,—*Morphine*, is the most complete. *Digitalis*, Ammonia, Alcohol, Atropine, and to some extent the tincture of Xanthoxylum, are also antagonistic. *Heat* externally, *Faradization* of the respiratory muscles, and *Artificial Respiration* are measures of prime importance. Brandy and Capsicum are useful.

Glass (coarse or powdered). ANTIDOTES,—Bread-crumbs freely to envelop it, then emetics.

Gold Salts. ANTIDOTES,—*Ferrous Sulphate*. *Albumin*, as eggs or flour. Mucilage. Emetics. Treatment as for Corrosive Sublimate.

Hyoscyamus. See Belladonna, page 811.

Hypochlorites, as Javelle Water (Potassium Hypochlorite), Labarraque's Solution (Sodium Hypochlorite), and Bleaching Powder (Calcium Hypochlorite). ANTIDOTE,—*Sodium Hyposulphite*, in dose of gr. xv, well diluted and frequently repeated, reducing them to chlorides, itself undergoing oxidation to the sulphate.

Illuminating-gas. ANTIDOTES,—*Chlorine-water* as spray, inhaled. ANTAGONISTS,—*Oxygen* by inhalation, 4 or 5 quarts. Ammonia vapor inhaled. Galvanism, by interrupted current to extremities. *Artificial Respiration*, to be maintained steadily for hours. Rhythmic traction of the tongue. Fresh air, in plenty; open all doors and windows. *Coffee*, black, a pint as enema. *Venesection* may be of service. *Douche*, alternately cold and warm, to head and chest. Horizontal position, clothing removed. *Alcohol* moderately by mouth or rectum. Catheter may be required in prolonged cases. Subsequently, a warm bed, heat applied to the body and limbs, open windows, perfect quiet, Condy's fluid about the room, stimulants sparingly, cold acid drinks freely.

Iodine. ANTIDOTES,—*Starch*, Albumin, Flour, Gelatin, Sodium and Potassium Carbonates and Bicarbonates. *Starch* is the antidote to free Iodine, but the stomach must be evacuated, as the Iodide of Starch is not inactive. In chronic poisoning by the Iodides, a free salivary flow induced by chewing Pyrethrum-root will hasten elimination of the drug. ANTAGONISTS,—*Quinine*, Digitalis, and other restorative agents and vaso-motor tonics. Amyl Nitrite. Morphine, for pain.

Ipecacuanha. ANTIDOTES,—*Vegetable Acids* and Astringents are incompatible with Ipecac, and may be used as antidotes. ANTAGONISTS,—*Bismuth*, Carbolic and Hydrocyanic Acids, also Narcotics, antagonize the emetic action.

Iron. ANTIDOTES,—Ammonium and Sodium Carbonates, ***Magnesia***, Mucilaginous drinks.

Lead Salts. ANTIDOTES,—***Sodium*** or ***Magnesium Sulphate***, Sodium Phosphate, Diluted Sulphuric Acid, Magnesium Bicarbonate, Ferrous Sulphate, freshly precipitated. Albumin, Milk. Emetics or the stomach-pump. *Potassium Iodide*, gr. xv–xxx, 3 or 4 times daily, in cases of chronic poisoning, as eliminative (R). The cachexia is much relieved by a combination of Quinine Sulphate, Ferrous Sulphate and Diluted Sulphuric Acid (B). Baths of *Potassa Sulphurata* (℥j or more in the necessary water), are also very useful in chronic poisoning by lead (R). ANTAGONISTS,—*Opium*, to allay irritation. *Belladonna*, the extract, gr. $\frac{1}{8}$, with Pulv. Rhei, gr. ij, in pill twice daily, for the great pain at defecation (Da C). *Alum*, is the most efficient remedy for the colic; to a pint of boiling milk add 90 grains of powdered Alum, separate the curd and sweeten with sugar; give a wineglassful every hour or two (B). *Strychnine*, for the paralysis, gives good results; also Atropine, gr. $\frac{1}{100}$, with Potassium Iodide, gr. v. *Electricity*, a slowly interrupted current until it causes reaction, for the paralysis of extensors (dropped wrist); cure to be completed by the faradic current (B). MARKED DIAGNOSTIC SIGNS of chronic poisoning by Lead are—the dropped wrist, due to paralysis of extensor muscles and a dark, blue line around the margin of gums.

Lime. See Alkalies, page 809.

Lobelia. ANTIDOTES,—*Tannic Acid*, to form the insoluble tannate. *Charcoal*, powdered in water, [see under Aconite, page 809]. ANTAGONISTS,—*Alcohol*, Digitalis, Belladonna, Ergot, the vaso-motor excitants, antagonize its effects on the circulation; Strychnine, Picrotoxin, and Thebaine, those on the nervous system.

Mercury. [See Corrosive Sublimate, page 812, also Metallic Salts below.] ANTIDOTES,—***Albumin***, Gluten, Flour, Milk. Vegetable astringents. Hydrated Protosulphide of Iron. Charcoal. *Alkalies*, especially Magnesium Bicarbonate (R). *Potassium Iodide*, to saturation of the system, as after-treatment; converts the metal into soluble combinations (B). *Baths*, simple or sulphurous (R). ANTAGONISTS,—*Bismuth*, Tannin, Sodium Sulphite, Diluted Nitric Acid in water, as gargles and mouth-washes for salivation. *Belladonna*, ♏v–x of tincture every 4 to 6 hours, to lessen secretion in ptyalism (B). *Hyoscyamine*, for the tremor, gr. $\frac{1}{30}$ gradually increased to gr. $\frac{1}{15}$ (Oulmont).

Metallic Salts. ANTIDOTES,—*Albumin*, Milk, Magnesia, Starch, Soap. *Oils* and other demulcents. Sodium or Potassium Carbonate or Bicarbonate. Lavage of stomach. Emetics and cathartics. ANTAGONISTS,—*Opium*, Alcohol, Cocaine and other stimulants, for shock and vital depression.

Mezereum. ANTIDOTES,—*Albumin*, Milk, Oils and Fats, Mucilaginous drinks. ANTAGONISTS,—*Opium*, as stimulant against shock and depression. Poultices, cool, to abdomen.

Morphine. See Opium, on the next page.

Muscarine. ANTIDOTES,—[see Alkaloids, page 810.] ANTAGONISTS,—*Atropine* exactly opposes Muscarine, and vice versâ. *Digitalis* is antagonistic to some extent, so also is Physostigmine. There is no example of physiological antagonism so complete in all particulars as that between Atropine and Muscarine. [See *ante*, page 119.]

Mushrooms. ANTIDOTES,—*Emetics*, if poisoning very recent; *Cathartics*, especially Castor Oil, if some time has elapsed. *Tannic Acid*, has been recommended. ANTAGONISTS,—*Atropine*. Alcoholic Stimulants. Poultices, warm, to abdomen. [Compare Muscarine, above.]

Narcotics. See Alkaloids, page 810, also Opium, Belladonna, Alcohol, Chloral Hydrate, Cannabis Indica, Carbolic Acid, Chloroform, Illuminating-gas, Hydrocyanic Acid, etc. *Vegetable Acids* antagonize their after-effects to some extent.

Nitrobenzol. ANTIDOTES,—*Ammonia*, diluted, by inhalation. Emetics. ANTAGONISTS,—*Alcohol*, Liq. Ammoniæ (ʒss in water), or Chloric Ether (ʒj in water), frequently repeated, as stimulants, given internally, by enema or hypodermically (brandy). *Atropine*. Artificial Respiration. *Galvanic current*, interrupted, to chest-walls, and over cardiac region. FATAL DOSE,—Death has resulted from merely tasting it.

Nitroglycerin. See Amyl Nitrite, page 810.

Nitrous Oxide Gas. ANTAGONISTS,—*Artificial Respiration*, to be commenced at once and kept up for two hours if necessary, not faster than 18 per minute. Fresh air, open all doors and windows, and fan the patient. *Oxygen* by inhalation, 3 or 4 pints. Douche to chest, alternately hot and cold. The tongue should be pulled well forward, and the mouth cleared of any obstruction to respiration, as artificial teeth. In apparently hopeless cases, two or three violent blows on the chest, delivered in quick succession, may restore the cardiac action (Murrell).

Nux Vomica and Strychnine. ANTIDOTES,—*Tannic Acid*, forms the very insoluble tannate. *Iodine* in dilute solution, or a soluble salt thereof. *Animal Charcoal*, largely. *Potassium Permanganate*, has been taken in large dose by Dr. Fahr, of Milford, N. J., after having ingested gr. ¾ of Strychnine, resulting in the entire absence of any symptoms of strychnine poisoning. *Lard*, is the antidote, as shown by numerous experiments on dogs and other animals (Turner). *Eucalyptus*, a decoction as a wash for the stomach; has a true antidotal action in frogs (Masmeci). *Emetics* or the stomach-pump should follow the administration of any antidote. The bladder must be frequently evacuated to prevent reabsorption. ANTAGONISTS,—*Quiet*, as perfect as possible, is very important. *Chloral* is the antagonist, gr. xxx as soon as possible, repeated in 20-grain doses at hourly intervals, as long as reflex exaltation continues. *Butyl-chloral Hydrate*, is a very energetic antagonist (Grigorescu). *Potassium Bromide*, is almost too slow of action to be of much practical service. *Chloroform* or Ether inhalation, to procure muscular relaxation. *Physostigma*, is antagonistic (R). *Chamomile Oil*, remarkably subdues reflex excitability in frogs after poisoning by strychnine or brucine (P). *Amyl Nitrite*, by inhalation (R). *Veratrum Viride*, cured a bad case; ʒj was given at once, then gtt. ij every ten minutes (R). Urethan. Methyl and Ethyl compounds of Strychnine, Brucine, and Thebaine. Monobromated Camphor. Ice to spine. Tobacco, by enema. Valerian mitigates the spasms (P). Curare, gr. ¼ hypodermically; is warmly recommended, but its claims are doubtful (P). *Apomorphine*, hypodermically, is very effective in dogs (Wills). *Nicotine*, many cases prove its curative power (P). *Hydrastinine Hydrochlorate*, in doses of gr. j hypodermically, has been successfully employed. *Artificial Respiration*, if possible. FATAL DOSE OF STRYCHNINE,—gr. $\frac{1}{2}$ for an adult, gr. $\frac{1}{16}$ for a child.

Opium and Morphine. ANTIDOTES,—*Tannic Acid*, or vegetable astringents, followed by evacuation of the stomach, if the poison has been taken by the mouth. *Charcoal*, ℥ss or more (R). *Apomorphine*, as emetic, gr. $\frac{1}{16}$ to $\frac{1}{10}$ hypodermically; must be administered before narcosis sets in (B). Stomach-pump better than emetics, which by the mouth are generally useless in these cases. *Potassium Permanganate*, an efficient antidote if given soon after ingestion of the poison [see pages 376, 404]. Compound Tincture of Iodine. ANTAGONISTS,—*Atropine*, hypodermically, gr. $\frac{1}{120}$ every 15 minutes for three doses (B); antagonizes the cerebral action, also that on the respiration, heart, and arterial tension; but, if given too freely, will endanger the case by deepening the narcosis [see page 404]; no one is warranted in omitting it (P). *Caffeine*, is antagonistic, and may be given hypodermically, though generally used in the form of strong coffee, frequently administered by mouth or rectum. *Cocaine*, is of especial value against the cardiac and respiratory depression. *Strychnine*, efficiently antagonizes the respiratory paralysis, and may be used in lieu of Atropine, or in conjunction therewith. *Amyl Nitrite*, by inhalation, or *Ammonia* by intravenous injection, when the heart shows signs of failure; the former proved eminently successful in a case wherein Atropine proved useless to restore the patient. *Capsicum*, the tincture, ℥ss–j by rectal injection, is said to antagonize the stupor almost instantaneously. *Vegetable Acids*, as Vinegar and water, Lemon-juice, Cream of Tartar in water, etc., every 10 minutes (R); to antagonize the narcotism. *Douche*, alternately cold and hot, or hot water and ice alternately to nape of neck, for the narcosis. *Artificial Respiration*, should be kept up for at least two hours (Murrell). *Oxygen*, by inhalation, is of great value (Macalister). *Venesection*, has proved effective after all other measures failed; is especially beneficial when death is impending from failure of respiratory action due to distention of the right heart with backward pressure (Marshall). *Potassium Bromide* removes some of the cerebral effects of Opium, as the vertigo and mental confusion; others are antagonized by *Quinine*, and the general intracranial effects of the drug are to some extent opposed by Digitalis and Tartar Emetic. THE IMPORTANT MEASURES indicated in Opium or Morphine poisoning are—(1) the removal of the poison, (2) the maintenance of respiration, (3) the keeping up of the circulation. The stomach should be evacuated at once, and then washed out repeatedly at short intervals, in order to recover the morphine which is constantly excreted into that viscus. *Faradization* of the chest muscles, cold affusion and artificial respiration are of great value, and evacuation of the bladder frequently is important, to prevent reabsorption. *Flagellation* is a very dangerous procedure, from the exhaustion which may be thereby induced,—strong faradic currents are much more efficient. The anode should be placed over the lowest conjoined root of the phrenic nerve, the cathode three inches below the ensiform cartilage and a little to the left of the median line. COMMON SOURCES OF DANGER,—Overdosing with cough mixtures, or *Paregoric*, or the *Soothing Syrups* so much used for quieting children, all of which contain Opium [see page 399]. The American Journal of Pharmacy estimates the loss of life from the latter cause at 150,000 yearly. FATAL DOSES,—see page 403.

Phenacetin. See page 808 under Acetanilid, for the treatment of poisoning by Phenacetin, Antipyrin and similar compounds.

Phosphorus. ANTIDOTES,—*Potassium Permanganate*, is probably the most reliable. *Copper Sulphate*, as an emetic and a chemical antidote, doses of 3 grains in dilute solution every 5 minutes, until emesis occurs; is recommended by authority, but does more harm than good. *Turpentine*, old and acid, containing oxygen, given rapidly in a gum emulsion, is said by some to be the best antidote; it is generally unattainable and has proved useless in many cases. *Lime-water* or Charcoal, to prevent action on the tissues. *Hydrated Magnesia*, as a quickly acting purgative; may be given in Linseed tea. *Copper Carbonate*, with sugar and water. *Avoid* Oils, Fats and Milk, as they dissolve the poison and promote its absorption. ANTAGONISTS,—*Opium*, to counteract the cardiac and systemic depression. *Transfusion*, to repair the blood.

Physostigma. ANTIDOTES,—*Emetics* or the stomach-pump. *Tannic Acid* or vegetable astringents. ANTAGONISTS,—*Atropine*, as to the effects on the respiration, heart and pupil; gr. $\frac{1}{60}$ to $\frac{1}{30}$ hypodermically, repeated until effects are evident. The one nine-thousandth of a grain of Atropine, injected 5 minutes before giving a minimum fatal dose of Physostigma, prevents its fatal result (R). *Chloral*, is also antagonistic, and over a greater field of action, but to be effective must be administered very early in the case (R); gr. x by mouth or rectum every $\frac{1}{2}$ hour. *Strychnine*, gr. $\frac{1}{60}$ of the sulphate or gr. $\frac{1}{12}$ of the nitrate, hypodermically; or the tincture of Nux Vomica, ♏xx by mouth or rectum, in very bad cases (Murrell). *Stimulants*, freely. *Artificial Respiration*. FATAL DOSE,—gr. $1\frac{2}{10}$ is given as the minimum fatal dose.

Picrotoxin. ANTIDOTES,—*Emetics* or the stomach-pump. *Acetic Acid* gives relief in overdosing, and may have some antidotal power. ANTAGONISTS,—*Chloral*, is antagonistic to its cerebral and spinal action, but synergistic to its depressant power over the heart and respiration. *Anesthetics*, against its spasm-producing action. *Potassium Bromide*, in addition to *Chloral*, if tetanus (Murrell).

Pilocarpine (Jaborandi). ANTIDOTES,—Persalts of *Iron* and salts of the metals generally, are chemically incompatible. ANTAGONISTS,—*Atropine*, gr. $\frac{1}{100}$ for gr. $\frac{1}{8}$ of the poison, is a complete antagonist, the most so known to physiological experimentation. Conversely, Pilocarpine is exactly antagonistic to Atropine, but Jaborine acts similarly to the latter. *Morphine* controls the nausea and vomiting.

Potash. See Alkalies, on page 809.

Potassium Bichromate. ANTIDOTES,—*Sodium* and Potassium *Carbonates* and Bicarbonates. Soap. ANTAGONISTS,—*Opium* or Alcohol, for the nervous and muscular depression.

Potassium Cyanide. See Cyanide of Potassium.

Potassium Nitrate (Saltpetre). ANTIDOTES,—No chemical antidote. Emetics or stomach-pump. Demulcent drinks and emollient enemata. Milk. ANTAGONISTS,—*Opium*, for the subsequent depression. Aromatics. Brandy.

Pulsatilla. ANTIDOTES,—*Tannic Acid*, followed by emetics. ANTAGONISTS,—*Alcohol*, Opium, Digitalis.

Quinine. ANTIDOTES,—*Emetics* and cathartics, also diuretics and sudorifics to promote elimination. ANTAGONISTS,—*Alcohol*, Opium, Coffee. *Morphine* antagonizes its cerebral action. *Atropine* that on the nervous system and heart, also its antipyretic power.

Rat-pastes,—contain Phosphorus or Arsenic. *Ratsbane* is Arsenous Acid (Arsenic). *Rough-on-Rats* contains Arsenic (which see).

Resorcin. ANTIDOTES,—*Albumin*. Soda or *Saccharated Lime*, in plenty of tepid water, as wash for stomach. *Emetics* or the stomach-pump. ANTAGONISTS,—*Stimulants* freely. *Heat* to the extremities. *Amyl Nitrite*, inhaled. *Atropine* and other cardiac and respiratory stimulants, cerebral excitants, and agents which raise the arterial tension, are physiologically antagonistic. *Friction* with warm hand. *Galvanism*, the interrupted current. FATAL DOSE,—ʒij nearly proved fatal (Murrell).

Rhus (Poison Oak or Ivy). ANTAGONISTS,—*Cocaine*, a 5 per cent. aqueous solution, or a 10 per cent. oleate, locally, is by far the most efficient application, promptly relieving the burning and itching. *Grindelia Robusta*, the fluid extract, 1 to 10 of water, or undiluted, is a very serviceable lotion. Other applications found useful are:—*Carbolic Acid*, 5 per cent. solution; *Lobelia*, as infusion, ℥j to the pint; solutions of Corrosive Sublimate, Lead Acetate, Chlorinated Soda, Lime-water with Linseed Oil, Alum-curd. ℞. Plumbi Acetatis, ʒij; Ammonii Chloridi (crude), ℥ss; Aquæ, ℥viij; as lotion on cloths constantly wetted therewith, is used with uniform success (Burns). *Soap-suds* and Hot Water, frequent washing therewith the surest, speediest and best treatment (Couch). *Aristol*, freely dusted over the part, gives magical relief (Levick). *Hydrogen Dioxide*, a solution washed over the face and hands, as a preventive (Behringer). *Sassafras*, an infusion of the bark, taken internally and applied locally, is almost specific for the rash (Hinton). *Sodium Sulphite*, granular, ʒj; Glycerin, ℥ss; Camphor-water, q. s. ad ℥iv, is preferred as a topical application (Behringer). *Opium* or Coffee, to relieve the nervous irritability. *Rest*, low diet, and laxatives are appropriate measures.

Sanguinaria. ANTIDOTES,—*Tannin*, Alkalies, and most of the metallic salts are incompatible. ANTAGONISTS,—*Opium*, Atropine, Amyl Nitrite, etc., to antagonize the depression of the circulation and the local irritant action.

Savine. ANTIDOTES,—*Epsom salt*. Demulcents. Emetics and purgatives, especially Castor Oil. ANTAGONISTS,—*Morphine*, gr. ¼ hypodermically. *Poultices* of linseed meal to abdomen.

Serpent-venom. ANTIDOTES,—*Potassium Permanganate*, hypodermically into the vicinity of the wound, after ligating the part above it (Weir Mitchell). *Chloride of Lime* (Chlorinated Lime) in solution, 1 in 60, injected in doses of 20 minims, produced recovery (Hodgson); after ligature applied above the wound, a solution, 1 in 12, was injected in doses of 30 minims, 25 injections in all in different parts of the body, brought about recovery after severe symptoms from the bite of a tiger snake (Mackenzie). *Hypochlorites* of Lime or Sodium, Chloride of Lime, and Gold Chloride, are absolute antidotes against serpent-venom (Calmette). *Antivenene* [see page 183]. *Carbolic Acid*, strong, or a Mineral Acid, as caustic, after forcible sucking of wound by a person with perfect mucous surface of lips and mouth, and thorough cleansing. *Ammonia*, ♏xij of Liq. Ammoniæ, diluted with 3 volumes of water, hypodermically into the radial vein, for snake-poison (Halford); is shown to be unavailing by Brunton and Fayrer (B). ANTAGONISTS,—*Strychnine*, hypodermically, has proved eminently efficient in numerous cases (Baron von Müller). *Alcohol*, as brandy or whiskey freely. *Arsenic*, for the rapid prostration (B). *Potassium Iodide*, ℞. Potassii Iodidi, gr. iv; Hydrarg. Chlor. Corr., gr. ij; Bromi, ʒv; Aquæ, ʒj; of which gtt. x in ʒij of Brandy, repeated if necessary (Hammond). *Viola Cucullata*, the common Violet, is used in Pennsylvania against rattlesnake venom. [See page 525.] *Agave Virginica*, is known in South Carolina by the name of "rattlesnake's master."

Silver Salts. ANTIDOTES,—*Sodium Chloride* (common salt), dissolved in water, largely diluted and freely used; precipitates the silver as the insoluble and harmless chloride, and acts as an emetic (R); vomiting should be induced at once, as silver chloride is soluble in a solution of sodium chloride and in the digestive fluids. Large draughts of salt and water should be taken and vomited, this being repeated until no silver remains. The stomach should then be filled with milk and the bowels moved by castor oil. *Alkalies*, especially Magnesium Bicarbonate (R). *Albumin*. ANTAGONISTS,—*Milk*, to allay the resulting irritation; it may serve as food until the stomach is restored. *Opium*, against results of irritation. [See Metallic Salts, page 814.] For the treatment of chronic poisoning, and regulation of a course of silver medication, see page 192.

Soda and Sodium Salts. See Alkalies and Potassium Nitrate, also Metallic Salts.

Stramonium. See Belladonna.

Strychnine. See Nux Vomica.

Sulphonal. ANTIDOTE,—*Alkalies*, freely administered. ANTAGONISTS,—Stimulants. Diuretics.

Sulphur and Sulphides. ANTIDOTES,—*Chlorine-water.* Sodium Chloride (common salt). Potassium Chloride. Ferrous Sulphate. *Chlorine Gas* or *Calcium Hypochlorite*, for Sulphuretted Hydrogen; the former should be well diluted with common air. ANTAGONISTS,—*Artificial Respiration* is the best treatment for poisoning by Sulphuretted Hydrogen.

Tartar Emetic. See Antimony.

Tin. ANTIDOTES,—*Albumin*, Ammonium and Sodium Carbonates, Milk. [See also Metallic Salts.]

Tobacco. ANTIDOTES,—*Tannin*, followed by emetics, or the stomach-pump. Iodides. ANTAGONISTS,—*Strychnine* is the true physiological antagonist to Nicotine (or Tobacco) and vice versâ. *Alcohol*, Ammonia, Ergot, Digitalis, Belladonna, antagonize its action on the circulation; Brandy is efficient, also strong Coffee. *Warmth* applied to the surface, also friction. *Artificial Respiration.* Recumbent position should be strictly maintained.

Turpentine. ANTIDOTES,—*Magnesium Sulphate* (Epsom salt), ℥j in water. *Emetics* or the stomach-pump. Demulcent drinks, as milk, barley-water, etc. ANTAGONISTS,—*Opium* or Morphine, if much pain, and for shock.

Tyrotoxicon (in milk, cheese, ice-cream, etc.). ANTIDOTES,—*Emetics*, if vomiting is not free; also the stomach-pump or siphon to rinse out the stomach with water. *Thymol*, Salol, Naphtalin, or other antiseptics. ANTAGONISTS,—*Opium*, or other sedatives, to allay irritation. *Stimulants*, when prostration.

Veratrum and Veratrine. ANTIDOTES,—*Emetics* or the stomach-pump. ANTAGONISTS,—*Alcohol*, Opium, Ammonia, Digitalis, and Belladonna counteract the cardiac depression. *Morphine* with Atropine hypodermically, or Laudanum internally, with alcoholic stimulants. *Heat*, dry, applied to the body. Recumbent posture strictly maintained. *Coffee*, strong, as enema. [See also Aconite.]

Wounds, Poisoned. ANTIDOTES,—*Ammonium Carbonate*, gr. v hypodermically in the vicinity of wounds caused by poisoned arrows, was repeatedly used with entire success by Parke, the surgeon to Stanley's last African expedition. [See page 147; also Serpent-venom on page 818, and the article on WOUNDS, in Part III.]

Zinc Salts. ANTIDOTES,—*Sodium* or *Potassium Carbonate* dissolved in warm water, largely diluted, used freely. *Albumin*, as eggs and milk, with tepid water, freely. *Tannic Acid*, or vegetable astringents, or strong tea. Lime-water. Soap-suds freely. Mucilaginous drinks. ANTAGONISTS,—*Opium*, or Morphine hypodermically. *Linseed-meal* as poultices to abdomen. *Enemata* of gruel or starch-and-water, if much abdominal pain.

Polypus.

Sanguinaria, has been employed as snuff for nasal polypi (P); with doubtful benefit (W). **Tannin**, finely powdered, as snuff blown daily into nostrils through a quill, is especially adapted to the soft and gelatinous varieties; while it has apparently no effect on the healthy mucous membrane it causes the complete withering of the polypus (Wa). **Zinc Chloride**, has been injected interstitially with success in a case of naso-pharyngeal polypus (Barthélemy). **Iron**, a solution of the Chloride is advised as an interstitial application (Auger). **Acetic Acid**, glacial, injection into the body of the tumor, will cause it to shrink up and to drop off in a few days. **Alum**, in powder, applied to point of origin to prevent recurrence (D). **Surgical**,—a nasal polypus should be seized with polypus forceps and twisted off at the neck; it may be removed through the mouth or the nostril; in a few cases the nostril must be dilated with a speculum, or the ala slit to give access to the root of the tumor (D).

Poultices.

Poultices and **Fomentations** are simply local baths utilizing warmth and moisture, relaxing the tissues and relieving pain. If applied early they will check inflammation, or assist the evacuation of pus when suppuration has set in. Poultices should be applied thick (thin in peritonitis), as hot as possible, covered with cotton-wool, and frequently changed; large at onset, very small after maturation. Belladonna and Glycerin, equal parts, smeared over tissues under a poultice, aid the latter greatly, also Tinctura Opii, especially when the skin is broken. Linseed-meal or Oatmeal, Starch, Bread, Bran, are best in the order mentioned; add the meal to boiling water, stir and spread quickly on warm linen. Charcoal under the poultice, when foul sores are being treated.

An excellent method of preparing poultices is to make several bags of various sizes, of either of the fabrics known as *Swiss* and *Cheese-cloth*, filling each bag half full with the linseed meal or other agent used, then sewing up the open end. When wanted for use one of these bags is submerged in boiling water for a few minutes, and on taking it out the meal is found to have swelled so as to fill the bag, which should then be squeezed to rid it of the superfluous water, laid on the part and covered with oiled silk and a bandage. If too hot it will scald the skin. (Potter.) The ordinary filthy poultice of flaxseed, slippery elm, bread and milk, has no place among the resources of the aseptic surgeon. The common poultice is a hot-bed for bacteria, and as such, it should be discarded. In the treatment of an ordinary furuncle with poultices, almost every surgeon must have seen occasionally the development of innumerable minute daughter-furuncles in the surface covered by the poultice. In phlegmonous inflammation of the fingers or hand, the prolonged use of the poultice is followed by maceration of the skin, extensive edema of the superficial structures, a flabby condition of the granulation—in fact all the evidences which point to the poultice as a means of favoring the extension of the infectious process (Senn).

Fomentations,—Flannel may be wrung very dry out of boiling water, applied and covered with oiled silk. *Spongio-piline*, a fabric composed of sponge and wool, coated with india-rubber, is an excellent vehicle for the application of warmth and moisture. The inner surface is moistened with hot water; and its utility may be increased by sprinkling the moistened surface with charcoal or yeast, or by saturating it with any desired lotion or liniment.

Pregnancy, Disorders of.

Mercury, a few grains of blue pill to correct clay-colored stools (L). **Iodine**, the tincture internally for cardialgia (Wa). **Aloes**, has cured piles in pregnancy, by removing constipation; cautiously! (P). **Alum, Tannin** or **Catechu**, in medicated pessaries for vaginal leucorrhea (L). **Castor Oil**, an excellent laxative (P); to clear out the bowels in diarrhea (L). **Cocculus Indicus**, when intestines much distended with flatus, and frequent desire to urinate from flatulent pressure on bladder (P). **Bismuth, Calumba** and **Antispasmodics**, with minute doses of Opium, for gastrodynia and pyrosis (L). **Potassium Bromide**, with Chloroform, as an antispasmodic in dyspnea (L). **Sumbul**, is invaluable in the restlessness; ♏xxx–xl of the tincture with a little Chloric Ether, giving quiet nights for a long time (P). **Galla**, Unguentum Gallæ cum Opio, the best local application to hemorrhoids, also fomentations with sponges wrung out in very hot water, to relieve pain (L). **Digitalis**, in infusion, very beneficial in the albuminuria (L). **Potassium Acetate**, with Basham's mixture (Liq. Ferri et Ammonii Acetatis), when albuminuria with anemia. **Calcium Phosphate**, believed to exert an influence on the fetus if administered during pregnancy, so that mothers who have borne only rachitic or scrofulous children [illegible] healthy ones (Wa). **Berberine**, found very useful in the periodical neuralgiæ of pregnancy, even in cases in which Quinine had previously failed (Maclagan). **Camphor** Liniment, for lumbar pains (Wa). **Senna**, the confection proves a mild and efficient purgative in the constipation of pregnancy (Wa). **Milk-diet**, the best remedy for albuminuria of pregnancy, if strictly carried out (Parvin). **Injections**, must be used carefully, even tepid water often induces uterine contractions (L). [Compare ALBUMINURIA, NEPHRITIS, NERVOUSNESS, PTYALISM, VOMITING OF PREGNANCY.]

Prolapsus Ani.

Nux Vomica, or Strychnine, especially when in children, with constipation; in the latter event add Nux Vomica to a purgative, as tincture of Rhubarb (R, P); Strychnine hypodermically, gr. $\frac{1}{12}$ for an adult every 48 hours, ¾ inch from anus and parallel to rectum, into the cellular tissue; generally requires 4 to 8 injections (Weber). **Piper**, the Confectio Piperis in doses of gr. lx to cxx, persevered in for 3 or 4 months, in chronic, weak subjects (Wa). **Sulphur**, has a beneficial effect in addition to its laxative value (R). **Alum**, in solution, gr. vj to the ℥ (R). **Ice**, locally, when parts inflamed (R). **Ergot**, the fluid extract injected into the perineum, is followed by immediate relief (Vidal). **Ferrous Sulphate**, ʒj to ℥viij aquæ, of which one-third by enema twice daily. **Podophyllin**, in small doses for rectal prolapse in children (P). **Tannin**, by injection to restrain the prolapsus (R). **Hydrastis**, by enema, or as a lotion (P).

Prolapsus Uteri.

Cimicifuga, to prevent miscarriage in prolapsus uteri (R); has a remarkable effect upon the uterus (P). **Astringents**, as Decoctum Quercûs, Decoctum Gallæ (Wa); or Pomegranate bark (P). **Tannin**, as Catechu, Kino, Rhatany. **Alum**, a solution, gr. vj to the ℥ (R): lb. j ad C j aquæ, as hip-bath; should also be passed well up vagina (Wa). **Ice**, locally when parts inflamed (R); applied to the spine (Wa). **Pessaries**, in any form, are of but temporary benefit, and in the end positively detrimental (E); but many cases cannot be treated without mechanical support of some kind.

Prostate, Hypertrophied.

Alkalies, for the cystic irritation with acid urine; great benefit from Liquor Potassæ, or the Citrate and Acetate of Potassium (B). **Triticum Repens**, benefit follows its use in the prostatic enlargement of old men (Sir H. Thompson). **Ammonium Benzoate**, for the cystitis, urine alkaline (B). **Ammonium Chloride**, is occasionally useful, gr. xv–xxx, 3 or 4 times daily (Wa). **Iodine Injections**, through rectal walls (B); a weak ointment applied by rectum (Wa). **Iodine**, has been tried in all forms, but is of no value (Thompson). **Iodoform**, as suppository in the rectum, has proven of great value (B). **Colchicum**, in persons of a gouty diathesis (Wa). Medicine is not likely to have any control over this condition, which is a simple hypertrophy; castration was suggested by J. Wm. White, and has been performed with successful results in three cases by Haynes, also by other operators. [Compare CYSTITIS.]

Prostatitis.

Cantharides, a drop of the tincture, 5 may be required, 3 or 4 times a day (R). **Triticum Repens**, is found to be of benefit (Sir H. Thompson). **Urino-Genitals**, especially Turpentine, Cubeb, Juniper, Cantharis (B); Cubeb, in doses of gr. xx daily, is found of much benefit (Wa); Buchu relieves (P). **Silver Nitrate**, a solution, gr. v–x to the ℥, applied to the prostatic urethra in chronic prostatitis, may be useful (Wa). **Blisters**, in chronic prostatitis, a small blister on each side of the raphé of the perineum, kept open 4 to 6 weeks, has given the best results (Wa). **Tonic** medicines and regimen should be prescribed (Wa). **Hot Injections**, to relieve pain (R). [Compare PROSTATORRHEA.]

Prostatorrhea.

Iron, the Tincture of the Chloride, when there is much debility (B); chalybeate tonics with Quinine and Strychnine (Gross). **Atropine**, indicated in all cases, with Potassium Bromide (Gross). **Potassium Bromide**, when irritability and excitement (B); indicated in all cases (Gross). **Lead**, injections of Goulard's Extract, ʒj to ℥x of water, night and morning, for 10 minutes at a time (Gross). **Ergot**, when relaxation exists (B). **Bougie**, methodically introduced, is one of the best local measures (Gross). **Hydrastis**, locally applied, a useful medicine (B). [Compare PROSTATITIS.]

Prurigo.

Antipyrin, as a symptomatic remedy, is efficient in true prurigo. **Alkaline Baths**, followed by a carbolized ointment, and Carbolic Acid internally, are of value in the papular eruption known as prurigo (Bulkley). **Sulphides**, Potassa Sulphurata, with Tar and Benzoinated Lard, as ointment in genuine prurigo (R). **Arsenic**, in doses of ♏v of Liquor Arsenicalis thrice daily and gradually increased, has exercised a more or less powerful influence (Wa); has only a moderate effect (Bulkley). **Belladonna**, controls cases which have resisted ordinary treatment (B). **Carbolic Acid**, locally and internally, is especially serviceable in prurigo senilis (B). **Mercury**, the Bichloride gr. xx with Ammonium Chloride gr. xxx, in Oj of pure water, as lotion in prurigo contagiosa, the so-called army-itch; nothing equal to it (White). **Borax**, a saturated solution in rose-water locally (R); gr. v–x to ℥j of hot water for pruriginous eruptions on mucous membrane of vulva and vagina (R). **Galvanism**, when prurigo is referable to alterations in the cutaneous nerves (B). **Tonics**, are required, nerve-tonics as well as general ones, Cod-liver Oil, Quinine, Strychnine and Phosphorus (E. Wilson). **Quinine**, in large doses, gr. v–x, will control violent exacerbations (Wilson). **Baths**, the Turkish, frequently repeated, with inunction of the skin, may be regarded as curative in most cases (Wilson). [Compare PRURITUS.]

Pruritus.

Cocaine, in 5 per cent. solution or oleate, is by far the most efficient of all antipruritics; relieves the itching of scrotal eczema, pruritus ani et pudendi, and especially in lesions of the epidermis where the oleate or solution can penetrate at once to the true skin. **Resorcin**, in solution locally, gives marked relief, lasting for several hours, in the majority of cases. **Carbolic Acid**, is the opium of the skin (Unna), and the most useful antipruritic agent; in combination with glycerin, as lotion to the itching surface, gives great relief (Bulkley); internally and locally in pruritus senilis (B); a one per cent. solution as lotion in pruritus ani (R). **Chloral**, with Carbolic Acid, locally [see page 258]. **Camphor** and Chloral, rubbed together, make a liquid which, added to vaselin, gives an ointment which is powerfully antipruritic (Bulkley); added to dusting powders, allays heat and itching of eczema and intertrigo (R). **Tumenol**, as tincture, is used locally with almost universal success (Neisser). **Menthol**, seems to be of marked value in almost all cases of pruritus, from whatever cause (Squibb). **Antipyrin**, internally as a symptomatic remedy against itching, is omptly efficient in nervous pruritus, true prurigo, urticaria, erythema, pemphigus vulgaris and lichen ruber. **Alkaline Baths,** locally, followed by the application of carbolized ointment, give great comfort in all forms of pruritus (Bulkley); Sodium or Potassium Carbonate preferred (Tr); in solution locally, ʒiij ad ℥iv (B). **Brucine,** in 20 per cent. solution, has been employed with satisfaction in chronic pruritus, as a local application (Mays). **Mercury,** strong solutions of the Bichloride, Black or Yellow Wash or Mercurial Ointment, in the itching of skin affections (R); Yellow Wash is one of the most efficient applications for pruritus ani: solutions of the Bichloride are very useful applications in pruritus vulvæ et ani (Tr); for pruritus vulvæ a lotion of the Bichloride 1 to 2500 parts of water, with Alum and Starch, is recommended (B): Calomel ʒj to ℥j of Lard, as ointment, is the best application, except in the pruritus of urticaria; very useful in pruritus ani, less so in pruritus pudendi (R): the Oleate, a 5 per cent. solution in Oleic Acid with one-eighth part of Ether, applied by a camel's-hair brush, in pruritus ani et pudendi (Marshall). **Alum,** a strong solution is very useful for pruritus vulvæ (Tr). **Hydrocyanic Acid,** diluted as lotion, often very serviceable; may be prescribed in solution with Borax (B); or Laurel-water as lotion, especially in pruritus senilis (P). **Potassium Cyanide,** ʒj to Oj of water, as lotion, for pruritus of various kinds when the skin is unbroken (R); as ointment or solution, if strong enough, relieves greatly, but must be used with caution (B); or ♏xxx of the dilute Hcy Acid of the Br. Ph. in ℥j of water or glycerin, may be used instead (R). **Silver Nitrate,** a solution, gr. xx to the ℥, painted over the affected parts in pruritus vulvæ, is very effective (B). **Tobacco,** is an effective but dangerous application (B). **Iodoform,** as ointment, ʒj ad ℥j Adipis (R). **Iodine,** for itching of the nose or inner canthus, sneezing, etc., its inhalation has a marked effect (R). **Arsenic,** for itching of the nose accompanying asthmatic symptoms (R). **Benzoin,** the compound tincture painted on the skin, for the itching of eczema, urticaria, etc. (R). **Boracic Acid** makes an excellent lotion in pruritus pudendi, a teasp. to the pint of hot water (R). **Borax,** gr. v–x to the ℥ of hot water (R). [See PRURIGO.] **Balsam of Peru,** is a very good application in pruritus ani, scabies, and many other forms of itching (Auerbach). **Zinc Sulphate** and Alum, equal parts of each, are almost a specific in pruritus ani (Agnew). **Chloroform,** as ointment to allay itching of skin diseases. **Gelsemium,** ♏xv of the tincture every half hour, up to ʒj in all, for itching which is out of proportion to the cutaneous lesion (Pelcher). **Lead Lotions,** to ease the itching of urticaria, pruritus pudendi, etc., especially when the mucous membrane is red and excoriated (R). **Piperazin,** gives immediate relief in the pruritus of the uric acid diathesis. **Salicylic Acid,** as ointment, in pruritus ani et vulvæ (R). **Sodium Salicylate,** in 15-grain doses by mouth every four hours, will greatly relieve pruritus vulvæ, when due to diabetes (G). **Tar,** as ointment, is strongly recommended (Tr); for general pruritus, if no cause can be found, the two best remedies are Tar and Sulphur, as lotion or bath (Sparks); ointments containing Tar give relief in many instances (Bulkley). **Sulphur,** may be employed as a bath, Potassa Sulphurata, ℥ij ad C xv of hot water (Sparks); or the alkaline sulphites locally (Wa); the Iodide of Sulphur externally and internally, in pruritus senilis (Wa). **Chlorine,** the Liquor Sodæ Chloratæ, diluted, a useful application in pruritus ani (Wa). [Compare ECZEMA, ERYTHEMA, LICE, PEDICULI, PRURIGO, SCABIES, URTICARIA.]

℞. Hydrarg. Chlor. Corr., . gr. j.
Pulv. Aluminis, ... gr. xx.
Amyli, ... ʒjss.
Aquæ, ... ʒvj.
M. Sig.—Apply locally. (*Goodell.*)

℞. Acidi Hydrocyanici Dil., ʒss–j.
Infusi Althææ, ... ℥v–viij.
M. Sig.—Lotion. (*Fox.*)

℞. Acidi Hydrocyan. Dil., ʒij.
Sodii Boratis, ... ℥j.
Aquæ Rosæ, ... ℥viij.
M. Sig.—Lotion. (*Fox.*)

℞. Potassii Cyanidi, . . . gr. vj.
Pulv. Cocci, ... gr. j.
Ung. Aquæ Rosæ, . . ℥j.
M. Sig.—Ointment. (*Anderson.*)

℞. Potassii Cyanidi, . . . gr. xv.
Aquæ Laurocerasi, . . ℥ viij.
M. Sig.—Lotion. (*Anderson.*)

℞. Acidi Benzoici, ... gr. cx.
Olei Caryophylli, . . . gtt. xl.
Alcoholis, ... ʒ ijss.
Solve et adde—
Cerati Simplicis, . . . ℥ viij.
Balsami Peruviani, . . ℥ j.
M. ft. unguentum. Especially good for scabies, but may be used for any pruritus.

℞. Gummi Camphoræ,
Chloralis Hydratis, . . . aa ʒ j–ij.
Rub together until liquefied,
then add slowly, with friction,—
Unguenti Aquæ Rosæ, . . ℥ j.
Sig.—Ointment for itching.
(*Bulkley.*)

℞. Acidi Carbolici, ... ʒ ij.
Glycerini, ... ℥ j.
Aquæ Rosæ, . . q. s. *ad* ℥ viij.
M. Sig.—Lotion for pruritus.

Psoriasis.

Chrysarobin, has the most decided effect on psoriasis, ʒss–ij ad ℥j of ung. aquæ rosæ; often irritates, and should be employed at first with caution (Bulkley); gr. x–xxx to the ℥ of Petrolatum, applied to each spot twice daily, invariably successful (Hughes). **Thyroid Extract**, several cases of psoriasis treated with this remedy alone recovered completely in the course of a few weeks (Bramwell). [See page 158.] **Aurum,** is useful in the squamous skin diseases. **Ichthyol,** is a very efficient application. **Thiol,** is probably a better remedy than Ichthyol; the dry form, used as a dusting powder, is remarkably efficient (Squibb). **Aristol,** is an excellent application. **Arsenic,** at first apparently aggravates, but soon cures the disease (R); must be persistently used for a long time (B); exercises a powerful influence (Wa); maximum dose of Liquor Arsenicalis ♏v ter die, never on empty stomach (R). **Mercury,** in patches of obstinate psoriasis, especially of hands, even when not syphilitic; Calomel and Mercuric Nitrate ointment may be mixed and Tar ointment added (R). **Lappa Major,** a tincture of the seeds in whiskey, used by tablespoonful doses, cured several cases of long standing (Reiter). **Carbolic Acid,** 1 to 4 of lard, as ointment (Wa). **Mezereon,** a useful adjunct (Wa). **Sulphur,** internally (R); a solution of Potassa Sulphurata in water, is excellent in chronic psoriasis (B); not in acute (R). **Sulphur Iodide,** externally and internally, in doses of gr. j–vj used with great advantage (Wa). **Silver Nitrate,** occasionally in psoriasis of tongue and buccal mucous membrane; if syphilitic, mercurials best (R). **Nitric** and **Nitro-Hydrochloric Acids**, when symptomatic of imperfect digestion and assimilation (B). **Phosphorus**, as substitute for Arsenic (B). **Coptis,** has reputation in New England (B). **Copper Sulphate**, applied solid to spots (R). **Lead,** the ointment of the Iodide (B). **Tar,** painted on, in obstinate cases (R). **Oils**, Cod-liver Oil internally and locally, is the sheet-anchor, especially when of strumous origin (B); oils and fats to lubricate skin, also warm baths (R). **Diet and Hygiene**, nourishing diet, frequent small quantities of raw vegetables, Cod-liver Oil for growing persons, especially when stale fish the cause. Rest and change for overworked subjects. Open-air exercise is most useful. Warm or tepid soft-water baths at night, with use of pure soap; daily baths or cold sponge-baths.

Pterygium.

Silver Nitrate, locally, especially when pterygium with catarrhal conjunctivitis (Wa). **Treatment** is unavailing, and benefit is seldom derived from any operation (C). **Arlt's Operation**, the most satisfactory; cut away as little tissue as possible, dissect cleanly, close with suture (Green).

Ptosis.

, gr. x in ʒij of Sulphuric Ether and ℥j of Alcohol, brushed over brows and temples every morning, till a slight burning sensation is produced; conjointly with the use of electricity (W). **Ergot**, aqueous infusion as collyrium (Wa). **Electricity**, the constant current may often relieve recent cases (C). **Operation** for shortening the lid, by removing an elliptical piece of skin and subjacent muscle (C); is not advisable unless the ptosis is nearly or quite complete, and of great inconvenience.

Ptyalism.

Acids, as astringents, small medicinal doses (R). **Sulphuric Acid**, internally and with Decoctum Cinchonæ as a gargle, of great benefit in mercurial ptyalism (Wa). **Potassium Chlorate**, in simple or mercurial ptyalism (R); in the latter form ʒj ad ℥vj aquæ as mouth-wash, and internally in teasp. doses, 4 or 5 times daily (St). **Belladonna**, very effective in mercurial ptyalism, and that of pregnancy; gtt. v–x, or Atropine, gr. $\frac{1}{200}$ to $\frac{1}{100}$ every 4 to 6 hours (B); is good treatment when ptyalism is the result of some reflex action, but not so when it is an effort of nature to eliminate some drug-poison, as mercury, iodine, etc., from the system (Whitla). **Pellitory**, to stimulate the salivary flow in the latter case, unless the gums are swollen and ulcerated (Id). **Hyoscine** or **Opium**, may be used instead of Atropine (Id). **Astringents**, in ptyalism from excessive mercurialism when the gums are swollen and ulcerated; Alum 1 in 40, Zinc Chloride 2 grains to the ℥, Tannic Acid 1 in 40, or other vegetable astringents (Id). **Tannic Acid**, in mercurial ptyalism is an excellent gargle, ʒj of Tannin to ℥ij of Mel Rosæ, and ℥vj of water (B). **Alcohol**, diluted, as a gargle (R). **Potassium Iodide**, is sometimes beneficial in mercurial ptyalism, but often aggravates it (R). **Iodine**, the tincture ʒij in ℥viij of water, as a gargle (R); is worthy of trial (Wa). **Borax**, the glycerite is an efficient local application, but must be used almost continuously (Whitla). **Potassium Bromide**, has proved useful in the salivation of pregnancy; it may be combined with small doses of Belladonna or Hyoscyamus (Id). **Chlorinated Lime or Soda**, in weak solution, for the fetor (Id). **Stimulants**, may be needed in severe cases. **Diet**, liquid food when swallowing is difficult. [Compare the Lists of Sialogogues and Antisialics on page 62.]

℞. Acidi Sulphurici, . . . ʒss.
Tinct. Myrrhæ, ... ʒj.
Aquæ, ... q. s. *ad* ℥vj.
M. Sig.—Mouth-wash.

℞. Sodii Boratis, ... ʒij.
Pulv. Myrrhæ, ... ʒj.
Aquæ, ... ℥vj.
M. Sig.—Mouth-wash or gargle.

Puerperal Convulsions.

Chloroform, by inhalation to narcosis (R); its utility unquestionable when convulsions are not due to cerebral hemorrhage (B); the combined chloroform and chloral treatment results in a death-rate of only 7.6 per cent. (Winckel). **Chloral**, after the chloroform, given with Bromides by the rectum to keep up the effect; full doses, 20 to 30 grains every 2 hours (B); a remedy of the greatest value, in full dose before proceeding to one of the bromides (Playfair, Barnes). **Bromides**, in large doses by enema, are distinctly indicated (P); Potassium Bromide, ʒj–ij by the rectum, after venesection if convulsions return (Whitla). **Veratrum Viride**, in ʒss doses of fluid extract every 15 minutes, to nausea, invaluable (R); the fl. ext., in doses of ♏viij–x hypodermically, may be repeated in half-hour with Morphine, or ♏x by enema, promptly efficient in the worst cases (Elmer); a very bad case cured by 20-minim doses every hour for 5 days (Dunn); the worst case seen in my 30 years' experience, after 14 seizures was promptly cured by a hypodermic injection of ♏iv of Norwood's tincture in a little water (Etheridge). **Pilocarpine Nitrate**, gr. $\frac{1}{8}$ hypodermically every 2 hours, very successfully used in several cases (Finniss); is dangerous, being liable to cause edema of the lungs (P). **Aconite**, one of the best agents (P); gtt. j–ij of tinct. every 10 or 15 minutes for the first hour, then at longer intervals (B). **Belladonna,** the tinct. internally with Atropine hypodermically, of verified utility (P). **Potassium Bitartrate,** administered for a month prior to confinement, in quantity sufficient to bring about free action of kidneys and bowels, will certainly prevent puerperal convulsions (Anderson). **Opium** is apt to induce eclampsia, unless its use be preceded by free purgation or venesection (Id); as Morphine hypodermically, the most important agent for cure of uremic convulsions (B); with the lancet, sometimes required (P); Morphine is combined with the chloral treatment by many authorities. **Amyl Nitrite,** by inhalation (B); may cause alarming hemorrhage (W). **Ice,** to the head (R); and mustard poultices at same time to the feet (Wa). **Venesection,** by far the most efficient measure (Wallace); when great cerebral congestion and vascular tension, shown by a livid face, a full and bounding pulse, and strong pulsation in the carotids (Playfair): remove 15–20 ounces of blood, and follow by enemata of Potassium Bromide, ʒj–ij, if convulsions return; Chloroform should be very cautiously used, if at all, after blood-letting (Whitla). **Compression of the Carotids,** Trousseau's method, often stops or materially modifies the attack, and may be used in most cases to gain time until chloroform narcosis is established (Id). **Saline Purgatives,** the best being Magnesium Sulphate, or the compound Jalap powder, with free use of the wet pack to act upon the skin, for the rapid elimination of the retained excrementitious products, urea, leucin, tyrosin, etc. (Id).

Puerperal Disorders.

Cimicifuga, in puerperal hypochondriasis, and depression (Wa, P). **Opium,** either alone or with alteratives, highly serviceable in puerperal intestinal irritation; a few drops of the tincture effectually arrests the diarrhea (Wa); when shock and marked exhaustion, a moderate dose is of benefit (L). **Castor Oil,** undoubtedly the best laxative (L); purgatives generally are not required, castor oil the very worst (Fordyce Barker); action uncertain (Parry). **Rhubarb,** or enemata, best means of stimulating bowels after fourth day (L); gr. xx–xxx in some aromatic water a good aperient (Wa). **Aliment,** in puerperal state should be easy of digestion and sustaining (L). **Catheter,** necessary often for several days when bladder paralyzed, if warm water lavements fail (L). **Water,** tepid sponging of external parts, vaginal washings daily with warm water, with $\frac{1}{100}$ part Carbolic Acid (L). [See AFTER-PAINS, HEMORRHAGE, LABOR, LACTATION, MASTITIS, NIPPLES, PHLEGMASIA ALBA DOLENS, etc.]

Puerperal Fever.

Aconite, drop doses every one or two hours steadily, with an occasional dose of Castor Oil, and repeated hot poultices or Laudanum fomentations, the most successful treatment, even in the worst cases, but useless if not promptly efficient (P). **Veratrum Viride,** is used with great benefit in most cases (Barker). **Opium,** for wakefulness and delirium (B); a very valuable remedy, tending to allay pain, and reduce excitement of the nervous and vascular systems (Wa). **Alkaline Sulphites,** especially valuable in early stages, internally and locally; gr. xv–xxx of Magnesium or Calcium Sulphite every 2 or 3 hours, with injections every day (Wa). **Stramonium,** when cerebral excitement (P). **Potassium Permanganate,** gr. ¼–j ter die, has been given with benefit (B). **Alcohol,** freely used, until all evidence of sepsis subsided, caused recovery in one of the most desperate cases of puerperal septicemia of three weeks' standing, with temp. falling to 95° and rising to 107° (Hills). **Calumba,** preferable to Cinchona (P). **Quinine,** only large doses are useful; gr. v–xx every 4 hours (B); reduces the tem [illegible] **Warburg's Tincture,** is more efficient than the largest [illegible] of puerperal malarial fever, ℥ss every four hours [illegible] diminishing doses to ʒj–ij, until convalescence is [illegible] r). **Turpentine,** when depression of the vaso-motor nervous system, cardiac weakness and tympanitic distention of abdomen (P). **Resorcin**, is much used in Vienna by Braun; gr. xl repeated p. r. n. **Streptococcus Antitoxin**, has been used with success by several authorities [see page 182]. **Rest** and quiet but attentive nursing, frequent liquid food. **Water**, hot fomentations frequently to the parts, valuable as preventive. **Antiseptic Injections** into the uterus are used, but are strenuously opposed by many of the most prominent and experienced clinicians. [Compare PUERPERAL PERITONITIS, SEPTICEMIA.]

Puerperal Mania and Melancholia.

Stramonium, will allay cerebral excitement and soothe the nervous system; when delirium mild and furious, but intermittent; tendency to suicide or to destroy the child; ♏x–xx of tinct. every 3–4 hours (P). **Hyoscyamus**, in the milder cases; when nervous system is greatly excited (P). **Duboisine**, as calmative and hypnotic, acts efficiently for a time in puerperal mania. **Aconite**, in puerperal mania with high fever and restlessness; speedy and marked success follows if given soon after the chill (P). **Cimicifuga**, has cured (B); its effects are truly remarkable in the mania and hypochondriasis of the puerperal state (P). **Chloral**, often alleviates symptoms (B); to produce sleep (Wa). **Potassium Bromide**, in sthenic cases (R); its effects are very variable (Wa). **Anesthetics**, Chloroform or Ether inhaled in violent paroxysms of mania (B). **Tartar Emetic**, in frequently repeated doses (Wa). **Quinine**, when much weakness; skin cold and sweating (B). **Chalybeates**, Tinct. Ferri Chloridi, ♏v–xx, in the anemic form (B). **Opium**, cautiously (B); gives the best results in such doses as may be necessary to allay irritation and procure sleep (Wa). **Poultices**, hot fomentations, enemata, or gentle laxatives; nutritious and stimulating diet. **Lochia**, should be watched (P). **Weaning**, imperative in melancholia; not so in acute mania.

Puerperal Peritonitis.

Aconite, has cured cases of the usual type (P). [See under PUERPERAL FEVER.] **Cimicifuga**, especially in rheumatic form, has remarkable effects (P). **Opium**, its curative power in this, one of the best established facts in therapeutics (B); is good, but Aconite often better (P); especially valuable in adynamic cases (Wa); the drug of all others to be relied on (Godson). **Turpentine**, as stimulant, ♏x frequently repeated, better than Alcohol (B); by enema, also hot turpentine epithems may be used with advantage (Wa). **Quinine**, in considerable doses, with or without Opium (B); gr. x–xx twice daily as an antipyretic (Wa). **Antimony**, as Tartar Emetic, gr. $\frac{1}{10}$ to $\frac{1}{6}$ every hour to shorten attack and render it more mild (R). **Cathartics**, advised by many, prohibited by as many; evidence is in favor of mild aperients combined with Dover's powder or Hyoscyamus (Wa). **Poultices**, hot, of very great value (B). **Water**, Ice in mouth or swallowed, hot fomentations to abdomen; in some cases cold compresses best. [Compare PUERPERAL FEVER.]

Pulse.

Aconite, for a quick, resisting pulse (P); a moderate dose, while it makes the pulse less frequent, renders it fuller, stronger and less compressible (R). **Veratrum Viride**, reduces febrile heat with abnormal rapidity of pulse (P). **Veratrine**, pulse at first quick and strong, then slowed; afterward quick, weak and irregular (R). **Digitalis**, for weak, quick pulse. [Compare HEART DISEASES, FEVER, etc., also the Lists of Vascular Contractors and Dilators, on pages 65, 66.]

Purpura.

Sulphuric Acid, often acts happily (B). **Ergot**, has been strongly urged (R); is most useful in removing purpura (P); many cases are recorded as cured by hypodermic injections of Ergotin (Wa). **Turpentine**, has been used (R); with invariable benefit (Wa). [See HEMATEMESIS.] **Nux Vomica**, no prescription more generally useful than the Syrup of Iron, Quinine, and Strychnine (B). **Iron**, when due to anemia; the tincture of the Chloride (B); is preeminently the curative remedy for purpura hæmorrhagica, arresting the hemorrhagic tendency in 24 to 48 hours (Pize). **Vinegar**, and water, is an excellent application by sponging over the body (E. Wilson). **Quinine**, or Huxham's Tincture of Bark, are much used (H). **Potassium Nitrate**, gr. x thrice daily in purpura simplex, used successfully (Wa). **Styptics**, as the Ammonio-ferric Alum, tincture of Ferric Chloride (Tr); Tannic and Gallic Acids, used in some cases (H). **Alum**, and brandy or whiskey and water at such temperature as is not chilling, applied by sponging the body, is the best local measure (H). **Wines** are generally indicated (B). [Compare HEMORRHAGE, SCURVY.]

Pyrosis and Cardialgia.

Capsicum, in atonic dyspepsia, with heartburn and diarrhea (P). **Nux Vomica**, of the highest possible value in atonic dyspepsia with heartburn, hiccough, regurgitation, etc.; an excellent combination is ♏v–x of the tincture with ♏xv of dilute Nitric Acid for one dose (P). **Pulsatilla**, a good medicine in the heartburn of dyspepsia in phlegmatic subjects (P). **Podophyllin**, gr. $\frac{1}{12}$ night and morning in obstinate heartburn, with liver derangement (P). **Almonds**, blanched, six or eight are said to relieve heartburn (P). **Rhubarb**, and other purgatives are often useful; also Magnesia, Bismuth, and Ginger (Beale). **Opium** in small doses has been advocated for water-brash (Id). **Catechu** and **Kino**, also other astringents, sometimes do good, and bitter infusions, especially that of **Calumba**, have been given with advantage in water-brash (Id). **Diet**, lemon-juice, aërated bread, plain biscuit, etc.; but avoid new bread, much vegetable food, and pastry. [Compare ACIDITY, DYSPEPSIA.]

Rachitis.

Lime, as Lime-water, or the Carbonate, or the Syrupus Calcii Lacto-phosphatis (B); in small doses (R); the Phosphate may be advantageously combined with Cod-liver Oil (Wa). **Iron**, the Syrup of the Iodide preferred; Calcium and Ferric Phosphates excellent in combination (B); must be continued a long time (R). **Nitro-hydrochloric Acid**, as baths, gives excellent results (Wa). **Quinine**, often very valuable (P). **Thymus Extract**, is suggested as probably useful [see page 160]. **Aliment**, food rich in Calcium Phosphate and other phosphatic salts; oatmeal, Graham bread, etc. (B): Cod-liver Oil, the best constructive agent (B); a full animal diet (Wa); cold sponging (R).

Rectum, Diseases of.

Podophyllum, in doses of gr. $\frac{1}{20}$ to $\frac{1}{10}$ night and morning, for a child, may relieve prolapsus of the rectum (P). **Belladonna**, the extract locally in fissure (R); and irritable ulcers (P); internally and locally to remove ulcers, also excellent for burning pain following defecation; or with mercurial ointment, equal parts of each, for fissures and ulcers (P). **Acetanilid**, in fine powder, is an excellent application to ulcers of the rectum. **Phosphorus**, in chronic inflammation of the rectum, has been highly recommended (R). **Cocaine**, gr. xl to ℥j of glycerite of starch, applied by Seeley's Pile-pipe, very efficient in controlling spasm of the rectum. **Potassium Bromide**, in 5 parts of glycerin, locally, for fissures and painful growths (R). **Iodoform**, as suppository in painful diseases, relieves greatly (R). **Pepper**, the confection, as gentle stimulant in fistula, ulcers, hemorrhoids (P). **Castor Oil**, in fissure and hemorrhoids, is commonly used as purgative (R, P). **Sulphur**, with Confectio Sennæ, in irritable rectum, is very soothing (Wa). **Stramonium**, an ointment of the fresh leaves to alleviate pain (P). **Conium**, the extract in doses of gr. x to allay pain and irritability in rectal cancer (Wa). **Spigelia Anthelmia**, an enema of the juice, also a decoction internally, are used by the Venezuelan natives with success in the epidemic gangrenous proctitis of that country (Ackers). **Lemon**, roasted, and one of the quarters introduced into the rectum once or twice daily, is used with very satisfactory results in the same affection (Id). **Purgatives**, are best for proctalgia (D). **Surgical**, an incision through mucous membrane, and in severe cases to divide part of the sphincter, in ulcer or fissure; a flake of cotton should be laid in the wound, so that it may heal by granulation (D). [Compare ANUS, DIARRHEA, DYSENTERY, HEMORRHAGE INTESTINAL, HEMORRHOIDS, PROLAPSUS, RECTUM ULCERATION OF, SPRUE.]

Rectum, Ulceration of.

Mercury, the Red Oxide, ʒj to the ℥j of Unguentum, as ointment in flat ulcers of rectum existing just within the anus (Coulson). **Belladonna**, the extract locally for rectal ulcers, is very efficient (P). **Carbonic Acid**, per anum, is strongly advised (Wa). **Chloroform**, as ointment, in irritable ulcer of rectum (Curling). **Iodoform**, in suppository, extremely useful in painful ulceration (R); used in many cases with satisfactory results, but in some instances poisoning occurs; hence it should be used with caution (Wa). **Phosphorus**, as an internal remedy, is highly recommended in chronic inflammation of the rectum (R). **Copper Sulphate**, with Opium, may often be used internally with advantage, and a weak solution of the same, or of Silver Nitrate, locally (Curling); the writer had a case resisting treatment for three years, in which a cure was effected by the persevering use of a pill of Cuprum Sulphate, Extract of Opium, and Quinine Sulphate [see below]. **Silver Nitrate**, gr. ¼–j combined in pill with Opium, gr. ss; and a solution, gr. x–xx to the pint, by enema (B). **Glycozone**, ℥j in ℥xij of lukewarm water, mixed immediately before using, and given by enema once daily, in ulceration and chronic inflammation of the rectum and lower gut (Edson). [Compare DYSENTERY.]

℞. Cupri Sulphat.,	
Morphinæ Sulphat.,	āā gr. ij.
Quininæ Sulphat.,	gr. xxiv.

M. ft. pil. no. xxiv. Sig.—One pill thrice daily. (*Potter.*)

℞. Chloroformi,	ʒj–ij.
Zinci Oxidi,	℥ss.
Olei Olivæ,	ʒj.
Cerati Cetacei,	℥iv.

M. ft. unguentum. (*Curling.*)

Relapsing Fever.

Cathartic, a mild one at beginning (H); if jaundice or other hepatic derangement, a Calomel purgative, cautiously lest irritation (Wa). **Potassium Citrate**, as cooling diaphoretic. **Quinine**, in moderate doses after the crisis, at least until the relapse, which will not be prevented by any amount of Quinine (Wa). **Leeches** or **Cupping**, best for headache (A). **Alcohol**, required by some patients. **Diet**, supporting, especially in third week, beef-tea, etc. **Urine**, should be watched carefully (A). [Compare TYPHUS FEVER.]

Remittent Fever.

Antipyrin or **Phenacetin**, in full dose during pyrexia, to lower the temp., is very efficient treatment, especially if conjoined with Quinine during the remission; the latter drug being too slow of action to be of immediate service in the pyrexia. **Aconite**, in the hot stage, if any febrifuge is required, frequently repeated doses (B); is next in value to Quinine for high fever and headache, gtt. j of a good tincture every hour (Da C). **Quinine**, 20 to 30 grains in single dose once or twice daily until the temperature is reduced, with other appropriate remedies (B); 15 to 20 grains at most (Maclean); 30 to 50 or 60 grains in severe cases of pernicious remittents several times a day without regard to exacerbation (P, B); 10 or 15 grains should be administered at once in bilious remittent and other severe forms of malarial fever, without waiting for the remission or sweating; an aperient may be given at the same time, 5 or 10 grains of Calomel is the best (Mn); when vomiting is severe the rectum should be cleared out with an injection of warm water and then an enema of Quinine gr. xxx in Water ℥iij, with a few drops of acid to aid solution, and 5 or 10 grains of Calomel may be given at the same time by the mouth (Id). **Warburg's Tincture,** has achieved a very high reputation, but must be used in less dosage than directed, and supporting treatment given when its sudorific action commences (Wa). **Gelsemium,** exercises a really beneficial influence; depresses the temperature (B); valuable in bilious remittents of the South (Pf). **Morphine,** gr. ¼ hypodermically to abort pernicious remittent fever (B). **Purgation,** by Calomel with Jalap or salines afterwards, is very necessary during the course of the disease (Da C). **Quassia,** an excellent tonic in the convalescence, combined with mineral acids (Wa). **Packing,** by the wet sheet, is resorted to with advantage, except when hepatic or splenic congestion exists (Wa). [Compare FEVERS TROPICAL, HEMOGLOBINURIC FEVER, INTERMITTENT FEVER, MALARIA.]

Retina, Affections of.

Mercury, in syphilitic retinitis, is of great value; Calomel gr. j–ij with Opium gr. ¼–½ every 4 or 6 hours; also mercurial inunction till the gums are affected or the disease yields (Wa). **Potassium Iodide** and **Bromide,** in combination, in retinal hemorrhage, to promote absorption of the effused blood and to benefit the congestion (C). **Physostigmine,** locally, to contract the pupil, and diminish the amount of light admitted to the eye (Wa). **Iron,** in full doses, generally the tincture of the Chloride, in pigmentary retinitis; seems to have a tendency to arrest the malady (C). **Leeches,** to the temple better than general bloodletting (Wa); when much local congestion present, depletion by artificial leech is almost always indicated (C). **Pilocarpus,** in detached retina and optic neuritis; has been found a very useful remedy in retinal affections generally. [Compare AMAUROSIS.]

Rheumatism, Acute.

Plans of Treatment, may be resolved into three, viz.,—(1) that by Salicylic Acid, (2) that by Alkalies, (3) that by Iron. **Salicylic Acid or the Salicylates,** in 20-grain doses, to not less than ʒij in 24 hours, in solution with excess of alkali, is especially suited to vigorous, sthenic subjects, whose stomachs will bear it, in whom it often effects a cure in 3 or 4 days. **Salicin,** gr. x–xxx every 2, 3, or 4 hours; gr. xv every 3 hours in powder mixed with water (Maclagan), or same dose of Salicylic Acid, is of great benefit; good effect generally experienced within 48 hours (R); the Acid is better than the Salicylates, but must be abandoned if not effective after 3 or 4 days (Da C). **Oil of Gaultheria,** as a substitute for Salicylic Acid, used very successfully in form of emulsion (B). **Alkalies,** for flabby, fat subjects; alkaline carbonates, as Potassium Carbonate ℥jss every 24 hours, alone or with a vegetable acid, until the urine becomes neutral or alkaline, when it may be reduced one-half, and so maintained for some days, when Quinine or Iron may be used; if successful, this treatment brings about a cure in two weeks: the alkaline treatment is now seriously questioned; an injurious dyscrasia results from their use (B); Potassium Bicarbonate, gr. xxx every 4 hours, in a dilute solution, until joint-symptoms and fever disappear (Wa): cardiac complications require **Ammonium Carbonate,** in 5-grain doses frequently, also **Infusion of Digitalis** with hypodermics of **Morphine,** and a blister over the precordium, followed by Iron and Quinine after the acute symptoms have subsided (B). **Tincture of the Chloride of Iron**, for feeble, anemic and nervous subjects, ♏xxx every 4 hours, with an occasional saline laxative, blisters around joints, and **Atropine**, as an anodyne rather than Opium, used hypodermically in the vicinity of the affected joint (B); very serviceable in pale, delicate subjects, ♏xx–xxx every 4 hours; also as prophylactic where tendency (Anstie); harmful to the plethoric and overfed (B). **Iron and Salicylic Acid** in combination, should be most valuable, but as heretofore prescribed has always made an insoluble precipitate; this is overcome by Dr. Peabody in the formula given on the next page, which makes a ruby-red mixture, and has advantage of preventing the anemia which results from the Acid given alone.

Aconite, very serviceable when much heat and dry skin (B); subdues pain in inflamed joints and perhaps shortens the fever (R); in small doses frequently repeated is of the greatest value, and if used from the start prevents organic cardiac disease (P); not reliable as a curative agent, but is a valuable adjunct to other remedies (Wa). **Veratrum Viride**, said to be useful (R); small doses as antipyretic, may be combined with Opium (P). **Salipyrin**, has been employed with excellent results, in 15-grain doses every ½ hour or hour, until about ʒij have been taken, continuing with smaller doses for a long time after convalescence, to prevent relapses. **Salol**, the great remedy, none superior (B); given in doses of 15 to 30 grains, up to ʒij in 24 hours, and continued for some time after acute symptoms have subsided; may prove toxic in large doses, with symptoms of carbolic acid poisoning. **Salophen**, is said to be equally efficient and non-toxic, ʒj–ʒjss daily. **Antipyrin**, has held a high place for several years [see page 172]. **Phenacetin**, is an efficient and safe antipyretic. **Phenocoll**, for the pyrexia, is used with marked success. **Rhus Toxicodendron**, positively invaluable in after-stage, also in subacute forms, muscular or tendinous, worse at night (P, Pf). **Hydriodic Acid**, the Syrup, in dessertsp. doses every 2 or 3 hours, the best remedy for acute and subacute rheumatism, relieving pain and swelling in 18 to 24 hours (Craig). **Cimicifuga**, has excellent reports (B); much used, and is said to quell the pain speedily (R); found very serviceable (P). **Dulcamara**, recommended especially for persons who are subject to catarrhal affections in cold and damp weather (P). **Ammonium Bromide**, an excellent treatment, followed by Quinine; gives a very low proportion of cardiac complications; gr. xv–xx every 4 hours (Da C); is disagreeable but strongly recommended (B). **Arnica**, lowers pulse and temperature, relieves articular pain and swelling, diminishes urea (P). **Trimethylamine**, ♏iv–viij in Peppermint-water, often has remarkable power in acute rheumatism and gout (B). **Bryonia**, after the swollen joints have been reduced by other means, is extremely efficient for the pain and stiffness (P). **Spigelia Anthelmia**, for rheumatic pericarditis and endocarditis; rheumatic fever with pain shifting from joint to joint (P); seems to fix the disease in certain joints, and prevent its shifting around (P). **Sulphurous Acid**, by fumigation, the patient covered with blankets and exposed to strong fumes, produces perspiration, sleep and relief (R). **Colchicum**, alleviates the symptoms, and shortens their duration (Wa). **Laville's Mixture**, is said to be a tincture of Quinine and Colocynthine, but it is more than probable that Colchicine is the active agent therein. **Quinine**, as antipyretic; not so useful as wet pack or cold bath; gr. ij–v after the more acute symptoms have subsided (B); is best for the head symptoms (Da C). **Opium**, strongly recommended as anti-rheumatic; gr. j every 2 or 3 hours, increased to gr. xij in 24 hours; tolerance remarkable in this disease; in rheumatic carditis indispensable (Wa); a very good remedy in moderate doses (Da C). **Lithium Bromide**, equally good in all forms, especially for insomnia, delirium (B). **Digitalis**, in powder, gr. ij every 4 hours, usually effective after 2 to 7 days; especially useful in cardiac complications with cyanosis and edema. **Lime-juice**, ℥viij daily, Lemon-juice inferior (R). **Blisters**, are a very effective method; a number of small blisters applied to vesication around a joint (B); large flying blisters around a joint (R). **Water**, cold baths for the hyperpyrexia (Da C); the wet pack efficacious in rheumatism, also a vinegar vapor bath (B); the wet pack, 20 or 30 minutes, and tepid (70°) shallow bath 1 or 2 minutes. Cold applications only when skin hot and dry, and temperature high. Warm baths, or hot compresses very useful. Spongiopiline an excellent substance for applications. **Diet**, low during the fever, water, barley-water, milk-and-water, gruel; use liquid food throughout, avoid malt liquors, port wine and sugar. Lemon-juice may be used freely. **Blankets**, instead of sheets to sleep in, and flannel underclothing, are useful adjuncts. **Pack** the joints with cotton covered with rubber cloth or oiled silk. **Dry Heat**, applied by the Tallerman apparatus is of great value in tendinous inflammations, also in subacute rheumatism through its sweating and local influence (W).

℞. Olei Gaultheriæ, . . . ʒj.
Acidi Salicylici, . . . gr. lxxx.
Sodii Boratis, ... ʒj.
Syr. Picis Liquidæ,
Aquæ Anisi, . . . aa ℥ij.
M. Sig.—A dessertsp. every two hours.

℞. Potassii Iodidi, ... ʒij.
Vini Colchici Sem.,
Syr. Simplicis, . . . aa ʒiv.
Aquæ Menthæ Pip., . . ℥v.
M. Sig.—Tablesp. every 4 hours.
(*New Orleans Charity Hosp.*)

℞. Propylaminæ Chlorid., . gr. xxiv.
Aquæ Menthæ Pip., . . ℥vj.
M. Sig.—A tablesp. every two or three hours. (*Tyson.*)

℞. Acidi Salicylici, ... ʒij.
Ferri Pyrophosphat., . . ʒj.
Sodii Phosphatis, . . . gr. xij.
Aquæ, ... ℥vj.
M. Sig.—A tablesp. every two hours.
(*Peabody.*)

℞. Ammonii Phosphatis, . ʒjss.
Tinct. Colchici Seminis, ʒj.
Tinct. Aconiti, ... ʒij.
Syr. Simplicis, ... ℥iij.
M. Sig.—A teasp. every three or four hours. (*Carson.*)

℞. Sodii Salicylatis, . . . ℥ss.
Tinct. Lavand. Co., . . ʒiij.
Glycerini, ... ℥v.
Aquæ, ... q. s. *ad* ℥vj.
M. Sig.—A tablesp. every three hours, well diluted.

Rheumatism, Chronic.

Arsenic, is very good in most cases, given in small doses steadily (Da C); is more efficient than Sulphur and should be used instead of the latter in the Chelsea Pensioner [see page 568], an old remedy for chronic rheumatism (Fothergill). **Sulphur** waters are undoubtedly efficient (Da C); Sulphur locally, also the Sulphides as baths (R); is certainly of benefit (B). **Guaiac** is another ingredient of the Chelsea Pensioner; is used with varying success (B); the ammoniated tincture in milk often gives excellent results (Da C); is vile to the taste. **Potassium Iodide**, especially when pains are worse at night, or of syphilitic origin (R); should always be fairly tried in chronic rheumatism (Da C); was Sir Astley Cooper's remedy; Iodides often prove very satisfactory, especially in strumous or syphilitic subjects (B). **Rhus Toxicodendron**, a very powerful agent in subacute muscular or tendinous rheumatism worse at night (Pf); the tendons, ligaments, and fasciæ are most benefited; externally, as lotion on compresses; also internally, small doses every two hours (P). **Aconite**, the extract as plaster to joints is unquestionably very useful (P); is more useful in chronic than acute rheumatism (Wa); the liniment of the B. P. locally over the sciatic nerve when affected (Fothergill). **Ichthyol**, is invaluable given internally in pill, gr. x–xxx thrice daily; also as ointment with Lanolin 50 per cent. (Illinsky); or as a liniment with Turpentine or an equal weight of a mixture of Lanolin and Olive Oil, with 30 per cent. of Chloroform. **Cimicifuga**, sometimes has wonderful success, yet often fails; no indications (B); in rheumatic neuralgias and headaches, and rheumatism of uterus (P); signally beneficial
forms (R). **Lithium Bromide**, gives excellent results, when smaller
swollen and tender (B). **Lithium Salicylate**, in 15- to 20-grain doses
r hours, gives good results in lingering, subacute cases after acute

attacks (Da C). **Colchicum**, is of decided advantage in the neuralgia of chronic rheumatism (B). **Colchicine Salicylate**, is used with satisfaction [see page 285]. **Bryonia**, is a useful remedy, especially for painful and stiff joints (P). **Mercury**, the oleate of Mercury and Morphine locally (R). **Mezereon** is strongly recommended (P). **Phytolacca**, has proved useful (B). **Dulcamara**, has been used with benefit (P). **Iodine**, locally, for pain around joints (R). **Quinine**, in rheumatism with debility, shown by night sweats or sweats during sleep and only then (Wa). **Arnica**, the tincture and infusion are useful (P). **Cajuput Oil**, internally and externally in muscular rheumatism (P). **Turpentine**, benefits and relieves the pains; internally and externally as liniment (P). **Aletris**, is extensively advertised as an efficient remedy. **Nuclein**, has been used with decided advantage (Vaughn). **Eucalyptus**, the leaves wrapped around the affected part, renewing them daily for a week or more, often very efficient as a local stimulant, but will produce vesication if too long continued (Gibbons). **Xanthoxylum**, has long had deserved reputation, ♏xv–ʒij of fluid extract (B). **Thuja Occidentalis**, is useful for rheumatic pains (P). **Manganese Sulphate**, is one of the remedies (B). **Belladonna**, the extract locally very valuable for pains (P). **Cod-liver Oil**, internally and externally, exercises some influence (B). **Chimaphila**, may prove useful, especially when lithiasis (P). **Lupulin**, as an anodyne (P). **Burgundy Pitch**, as plaster locally (P). **Aliment**, avoid spirits and malt liquors, coffee, also starchy, animal and saccharine food; the farinaceous vegetables and acid fruits suitable (B); Alkaline mineral waters have deserved reputation (B). **Turkish Baths**, in chronic muscular rheumatism (B); steam bath daily of great benefit, may be obtained at home by pouring water on hot bricks in a tub, the patient sitting on a board or chair above, enveloped in a blanket (Brick). **Carbonic Acid Baths** are sometimes beneficial [see page 93]. **Red Flannel** next skin, very popular, but white better, as the red often gives rise to eruptions (Da C). [Compare ARTHRITIS, LUMBAGO, MYALGIA, PLEURODYNIA, SCIATICA.]

℞. Pulv. Resin. Guaiaci,
Potassii Iodidi, ... aa ʒ j.
Tinct. Colchici Seminis, . ʒ iij.
Aquæ Cinnamomi,
Syrupi, . . aa q. s. *ad* ℥ vj.
M. Sig.—A dessertsp. to a tablesp. thrice daily. (*Pepper.*)

℞. Tinct. Guaiaci Æther., . ℥ j.
Tinct. Colchici Æther., . ʒ vj.
Tinct. Cann. Ind. Æther., ʒ ij.
M. Sig.—25 to 30 drops on sugar, every 4 hours, for rheumatic and neuralgic symptoms. (*Atlee.*)

℞. Acidi Arsenosi, ... gr. iij.
Pulv. Guaiaci, ... ʒ iij.
Pulv. Capsici, ... ʒ ss.
Pil. Aloes et Myrrhæ, ʒ iij.
Ft. pil. no. cxx. Sig.—One thrice daily. The modified Chelsea Pensioner.
(*Fothergill.*)

℞. Linim. Aconiti (B. P.),
Linim. Belladon., . . aa ʒ ij.
Glycerini, ... ℥ ij.
M. Sig.—Apply locally over the seat of pain. (*Fothergill.*)

℞. Olei Sinapis, ... ʒ ss.
Olei Terebinth., ... ʒ iij.
Camphoræ, ... ʒ iv.
Liq. Ammon. Fort., . . ʒ iij.
Tinct. Capsici, ... ʒ iv.
Alcoholis, . . q. s. *ad* ℥ vj.
M. Sig.—Russian Spirit, a liniment for rheumatism.

℞. Potassii Iodidi, ... ʒ j.
Potassii Nitratis, ... ʒ ss.
Ext. Cimicif. Fl.,
Glycerini, ... aa ℥ ss.
Vini Colchici Sem., q. s. *ad* ℥ ij.
M. Sig.—A teasp. after each meal.
(*Potter.*)

Rheumatism, Gonorrheal.

Opium, as Dover's powder, full doses in the acute stage (Wa). **Potassium Iodide**, with tonics and stimulants, after the acute stage has passed, followed by friction, shampooing, and passive movements of the joints (Wa). **Ammonium Chloride**, in free doses, especially when the muscles are affected (Fuller). **Potassium Chlorate**, internally, and as urethral injection, until urethral discharge is entirely stopped, then ♏xx of Tinct. Ferri Chlor. 4 times daily, with gr. x. of Quinine daily, and good food (Da C). **Aspirate,** when pus is discovered around the joints; the case will be one of pyemic rheumatism, and may involve more joints than one (Da C).

Rheumatism, Muscular.

Diaphoretics, as Dover's powder, with Potassium Nitrate, or Ammonium salts, also dry heat to the part involved and rest in bed (Da C). **Morphine** gr. ¼ and **Atropine,** gr. $\frac{1}{96}$, together hypodermically, are of great service in most forms (R). **Lithium Bromide,** is almost specific (B); Lithium and its salts where there is a uric acid diathesis. **Colchicine,** a $\frac{1}{10}$ solution in 5-minim doses hypodermically thrice daily into the affected muscles, very effective in cases resisting other treatment. **Colchicine Salicylate,** is used with benefit [see page 285]. **Aurum,** the Bromide of Gold and Arsenic is employed successfully (Barclay). **Jaborandi,** or Pilocarpine hypodermically, to get the skin acting freely, a great desideratum (Da C). **Potassium Iodide** and **Colchicum,** or Quinine, gr. xij–xvj in 24 hours, if the case lingers over a week (Da C). **Capsicum,** powdered, with Lard, ʒij to the ℥, rubbed over the part, night and morning, with a gloved hand, is very efficient (Macdonald). **Cimicifuga,** is often very efficient in lumbago, myalgia, pleurodynia, and similar conditions (Wa). **Xanthoxylum,** gives relief in some cases of muscular rheumatism (B). **Liniments** are of little use except to amuse the patient, but Chloral ℥j in ℥vj of Linim. Saponis, makes a good one (Da C). **Electricity,** the constant current daily renders good service. [Compare LUMBAGO, MYALGIA, NEURITIS, PLEURODYNIA, RHEUMATISM CHRONIC, TORTICOLLIS.]

Roseola.

Scarcely any treatment called for; no local application needed, as the rash is but slightly irritating. **Aconite** or **Belladonna,** according to the symptoms, or **Ammonium Carbonate** answers all the indications. [Compare MEASLES.]

Sarcinæ.

Sulphites and **Hyposulphites,** have been employed to destroy sarcinæ and torulæ in the stomach (R); or **Sulphurous Acid,** diluted, before each meal (Wa). The treatment of these microscopic fungi is that of the primary gastric affection. [Compare CANCER, DYSPEPSIA, GASTRIC DILATATION.]

Scabies.

Sulphur, a solution of Potassa Sulphurata ʒss in ℥j, as local application; an extemporaneous Sulphide may be made by boiling one part of quicklime and two of sulphur in ten of water (B); Sulphurous Acid, as gaseous bath, the quickest method; Hebra's mixture of Sulphur, Chalk, Tar, Soap and Lard, less irritating and equally sure (R). **Calcium Sulphide,** as a bath (W). **Sulphuric Acid,** internally, has cured when other remedies failed (Wa). **Storax,** equally serviceable and not irritating as is Sulphur, one part to two of Olive Oil, with a warm bath (R). **Mercury,** the Bichloride is very efficient, if used strong enough, but caution is required in its employment (B). [Formula on next page.] **Staphisagria,** a certain remedy; 3 to 5 of Lard, boiled for 24 hours, when cooled, after straining add a little essence; friction with this 4 times daily (Wa). **Balsam of Peru,** the best of all applications, killing the acarus, relieving the itching and dermatitis, and disinfecting the parts; rub in over the body after a warm bath (Bruce); is fatal to the itch-mite (Oldberg). ganese, the Oxide, ʒij to ℥j Adipis as ointment (B). **Copper Sulphate,** as n, ℥j to Oj, has been used with great success, after crusts are thoroughly removed with soap-and-water (B). **Alkalies**, as soaps or ointments to remove cuticle and break up burrows (R). **Carbolic Acid**, locally (B). [See under TINEA for formula.] **Cocculus Indicus**, as ointment, useful (P). **Tar Ointment**, relieves itching quickly and cures disease in 10 to 12 days (P). **Anise** or **Kamala**, as ointments, efficient (P). **Benzoic Acid**, gr. x–xx ad O½ aquæ, as lotion, effectual for the pruritus (R). [See formula under PRURITUS.] **Beta-Napthol**, in 3 to 5 per cent. alcoholic solution or as a 10 per cent. ointment, is by far the best application (Shoemaker); a 2 per cent. ointment applied by friction has caused acute nephritis in two brothers aged 6 and 8 years, one of whom died therefrom (Baatz). **Linen**, should be immersed in boiling water, other garments should be baked in an oven or well fumigated with Sulphur vapor, to destroy the acari and their ova (R).

℞. Styracis Liquidis, ... ʒij.
Ung. Sulphuris, ... ℥iv.
Ung. Petrolei, . q. s. *ad* ℥j.
M. Sig.—Apply after washing.

℞. Hydrarg. Chlor. Corr., . . gr. iv.
Alcoholis, ... ʒvj.
Ammonii Chloridi, . . . ʒss.
Aquæ Rosæ, . . q. s. *ad* ℥vj.
M. Sig.—Lotion for scabies, phthiriasis, and tinea versicolor. (*Fox.*)

℞. Sulph. Sublimat., ... ʒj.
Balsam. Peruv., ... ʒss.
Adipis, ... ℥j.
M. Sig.—*For children.* (*Duhring.*)

℞. Sulph. Sublimat.,
Olei Cadini, ... āā ʒij.
Cretæ Preparatæ, ... ʒiss.
Saponis Viridis,
Adipis, ... āā ℥j.
M. ft. unguentum. (*Bulkley.*)

Scarlet Fever.

Aconite, of the highest value for all marked increase of temperature (R); helps development of the eruption when due (P); in the early stage, when patient is not decidedly adynamic, is very useful (W). **Belladonna**, during the eruptive stage, when depression exists, and rash is imperfectly evolved (B); as prophylactic has been recommended (R); is often efficacious as prophylactic (P); the preponderance of evidence is certainly in favor of such use of the drug (Pf); this virtue is claimed by imposing authorities; when so given its dose is gr. ¼ several times a day (Tr). **Mercury**, gr. ¼ of Gray Powder every hour has marked effect on inflamed tonsils (R). **Ammonium Carbonate**, feeble circulation, cyanosis, delirium (B); in all forms, especially if given early (R); one of the most reliable remedies; gr. iij–vij, according to age, in milk or Cinnamon-water, every hour or two (Wa). **Potassium Iodide**, in full doses, a very satisfactory remedy (Mitchell). **Mineral Acids**, Muriatic internally and as gargle; Nitric locally to sloughs in the throat (R). **Salicylic Acid**, given in 125 malignant cases, with mortality of only 3½ per cent. (Shakowski). **Salol**, in doses of 7 to 30 grains daily, according to age, internally, with gargles of a solution of Carbolic Acid, used in several cases with recovery in all and without albuminuria or other complications (Quinc). **Carbolic Acid**, internally and as gargle, successfully used [see MEASLES, for formula]; seems to exercise some influence as prophylactic (Wa); is good for the vomiting and for its general effect on the disease; ♏j–ss, every 2 or 3 hours (Da C). **Sodium Sulpho-carbolate**, as a means of introducing Carbolic Acid into the system; has been successfully employed (Wa). **Chloral** with Paregoric, is highly efficient for calming the patient [see page 256]. **Potassium Chlorate**, in grain-doses every ½ hour, will not injure the kidneys, and will give results equal to those of larger doses on the throat inflammation (Smith). **Asclepias**, to promote the eruption (W). **Zinc Sulphate**, gr. $\frac{1}{16}$ every 3 hours, believed to have specific influence on the disease (Emery). **Sodium Benzoate**, is highly efficient, having slower but more permanent effects on the fever than Quinine or the Salicylates (Klebs). **Boric Acid**, makes an excellent gargle (Da C). **Juniper**, as diuretic when dropsy (R). **Magnesium Sulphate**, as purgative, to prevent sore throat and other sequelæ (R). **Veratrum Viride**, in convulsions (R). **Rhus Toxicodendron**, of great service, if typhoid or rheumatic symptoms (P). **Digitalis**, very useful; lowers temperature and maintains kidney action (B); the best antipyretic and diuretic, the infusion with dry cups for the renal dropsy in its inception; later on a milk diet and Basham's Mixture (Da C). **Potassium Permanganate**, locally to throat, and internally, gr. ¼–j ter die, has undoubted benefit (B). **Sulphurous Acid**, by inhalation, spray, or fumigation, in malignant sore throat (R). **Chlorine Water**, in sloughing of throat (R); seemingly prophylactic (Wa). **Quinine**, small doses in adynamic states, large in hyperpyrexia (B); very successful when used systematically from the start (Wa). **Ferric Chloride**, the tincture in doses of ♏x–xv, according to age, in advanced stage; when albuminuria and hematuria, is very valuable (Wa). **Mustard Bath**, on recession of rash, to bring it back (R). **Oil Inunctions**, very grateful, especially useful in desquamative stage; Cacao-butter the most elegant (B). **Ice**, sucked, for the sore throat (R). **Water**, cold baths with oil inunctions are all that are needed in mild cases; when temperature above 104°, urine scanty and rash retroceding, the cold-wet pack renders signal service (R); cold wet compress to neck, through the whole course, renewed every 3 hours (R). **Diet**, fruit, if ripe, in season, toast, gruel, etc., in simple cases; in malignant, extract of beef, stimulants as per pulse. Milk the most suitable aliment, both as nutrient and as diuretic; a strict milk diet was enforced during the illness in all the cases mentioned above under Salol (Quioc). [Compare ALBUMINURIA, BRIGHT'S DISEASE, UREMIA.]

℞. Acidi Borici, ... ʒss.
Potassii Chloratis,
Tinct. Ferri Chloridi, aa ʒij.
Syrupi,
Aquæ, ... aa ℥ij.
M. Sig.—Tablesp. every 2 hours, to a child of five years. (*Smith.*)

℞. Acidi Carbolici, . . . ʒss–j.
Vaselini, ... ℥iv.
M. Sig.—By inunction to the entire surface.

℞. Acidi Salicylici, . . . ʒij.
Tinct. Aconiti, ... gtt. xij.
Infusi Digitalis, ... ℥jss.
Spt. Ammon. Aromat., . ʒiij.
Syr. Aurantii Cort., . . ℥ss.
Aquæ, ... ℥j.
M. Sig.—Teasp. every 3 hours, for a child of five years. (*Brown.*)

℞. Acidi Borici, ... ʒiij.
Glycerini, ... ℥iv.
M. Sig.—For a pint of water, to be used as a gargle. (*Da Costa.*)

Sciatica.

Opium, internally and externally (Wa). **Morphine**, hypodermically, is especially curative in sciatica (B); 3 or 4 injections of gr. ⅙ each may almost be regarded as a specific (Wa); a single injection sometimes cures long standing cases permanently; if not it may be repeated every second day or so (R); should be injected deeply into the adjacent muscular structure (Pepper). **Apomorphine**, gr. $\frac{1}{10}$ hypodermically, given by accident instead of morphine, caused immediate disappearance of the pain in a very severe and intractable case, not returning again for 12 months, and then only a slight attack which progressed favorably under Potassium Iodide and Gelsemium (Owen). **Antipyrin** or **Acetanilid**, efficiently analgesic. **Salipyrin**, has been employed with excellent results in rheumatic sciatica. **Salicylic Acid**, as paste locally, ℥j with ℥iv of Lanolin and Ol. Olivæ, q. s., also Rhus. Tox., gtt. j of a 1 per cent. solution of the fluid extract internally every 4 hours, cured one very obstinate case (Aulde). **Salol**, gr. vij in evening and gr. xv more at midnight, completely cured me after 3 weeks' suffering in bed, unrelieved by other remedies (Aschenberg). **Ether**, as spray, is generally of temporary value (R). **Guaiacol**, painted over the nerv [illegible] anesthetic. **Aurum**, the Bromide of Gold and Arsenic has [illegible] chronic cases. **Chloroform**, applied on flannel [illegible] d covered with oiled silk (Wa); ♏xv of [illegible] loroform, by deep hypodermic injection into the vicinity of the affected nerve, gives the best results in old cases (B). **Cocaine**, a 4 per cent. solution, hypodermically along the course of the nerve, affords instant relief (Wa). **Gelsemium**, has been used with varying success. **Nux Vomica**, is often successful in chronic sciatica (Wa). **Belladonna**, has afforded relief (R); Atropine, hypodermically, is curative, gr. $\frac{1}{50}$ to $\frac{1}{30}$ in the vicinity of the nerve (B). **Stramonium**, gr. ¼ to ½ every 3 or 4 hours for 4 or 5 doses, often affords decided relief, but should be stopped when the slightest symptoms of narcotism appear (P). **Duboisine**, is a good substitute for Atropine, and equally effective. **Veratrine**, in strong ointment or oleate locally; the tincture of Veratrum Viride internally is also recommended (R). **Aconite**, locally (P); as ointment controls sciatica in some cases (R); valuable in many obstinate cases (Wa). **Ammonium Chloride**, in mild forms (R); in cases occurring in the young (Anstie). **Iodides**, in syphilitic or metal poisoned subjects (B); often fails (R); Potassium Iodide in daily doses of ʒj dissolved in Decoction of Sarsaparilla, most efficacious in subacute or chronic (Wa). **Turpentine**, causes an exquisite sensibility along the track of the great nerves (Tr); occasionally of great value in sciatica, yet not a specific, nor have we scientific indications for its use (P); ℥ss doses for 4 to 8 successive nights (R). **Sulphur**, locally, believed to relieve the pain; effect probably due to the flannel surrounding it (R); is worthy of trial after active symptoms are subdued (Wa). **Phosphorus**, in neuralgic form; less satisfactory in sciatica than in other neuralgias (R). **Rhus Toxicodendron**, a very powerful therapeutic agent in various rheumatic affections of the fibrous tissues (P). **Cimicifuga**, is highly extolled (R). **Nitroglycerin**, in doses of ♏j thrice daily, gradually increased to ♏v, of a one per cent. solution, promptly curative in a long-standing and severe case (Lawrence); its powerful anti-neuralgic properties were well exhibited in 3 cases which would not respond to other agents, two being cured and one remarkably improved thereby (Mikhalkine). [See formula below.] **Cold** of intense degree, produced by refrigeration of limb by Methyl Chloride, extremely efficient (Jacoby); has been found effectual when applied to the sound limb. **Cantharides**, as counter-irritant, to free vesication (R). **Aquapuncture**, has had extraordinary success (B). [See under NEURALGIA.] **Acupuncture**, occasionally affords instant relief (B); often cures cases of long standing (R). **Nerve-stretching**, by forcibly flexing the thigh on the abdomen (Lange). **Poultices**, applied very hot (R). **Turkish-Baths**, are often very useful (R). **Electricity**, produces excellent results (B); does great good, but often aggravates; the continuous current best, when stage of acute inflammation past (W); galvanism often quickly relieves the pain (Pepper). **Cod-liver Oil**, should always be tried in obstinate cases (W). [Compare NEURALGIA, RHEUMATISM CHRONIC.]

℞. Tinct. Colchici Seminis,
Tinct. Belladonnæ,
Tinct. Aconiti, ... aa ʒj.
M. Sig.—♏vj every 6 hours. Remarkably efficient. (*Metcalf.*)

℞. Tinct. Trinitrini (1 p. c.), . ʒjss.
Tinct. Capsici, ... ℥ij.
Aquæ Menthæ Piper., . . ℥iv.
M. Sig.—5 to 10 drops to be taken three times a day. (*Mikhalkine.*)

Scleroderma.

Cod-liver Oil, our sheet-anchor, used internally and locally (B). **Electricity**, is used successfully (B); with stimulating inunctions offers the best prospect of improvement (Bulkley). **Strontium Iodide**, has been used, with varied results.

Sclerosis.

Aurum, the preparations of Gold are among the remedies which are believed by some writers to retard the progress; others being Arsenic in full doses, Silver Nitrate in ¼ grain doses, Physostigma and Ergot (Osler): Gold is a specially curative agent in all forms of sclerosis, including cirrhosis of the liver, interstitial nephritis, cirrhosis of the lungs, etc.; and Dr. Barclay's Liquor Auri et Arseni Bromidi is very efficient in these affections, and much superior to the Chloride of Gold and Sodium (E. A. Wood). [Compare the titles mentioned in this article, also ATHEROMA, LOCOMOTOR ATAXIA, PARALYSIS AGITANS.]

Scrofulosis.

Ammonium Iodide, when glandular enlargement (Wa); **Ferrous Iodide**, when debility and emaciation, a powerful and efficacious remedy; also in anemia of scrofula, the syrup ♏xx–ʒj ter die (Wa); useful in simple glandular hypertrophy, but disappointing in scrofulous (B). **Strontium Iodide** has been used with varied results in scrofulous otorrhea. **Iodine**, tinct. or oint. applied over scrofulous glands—take care not to increase inflammation (R): Iodine and Iron the best remedies, but all medicines utterly useless without strict hygiene (A). **Aurum**, the Bromide of Gold and Arsenic has rendered good service in a case of adenitis with enormous enlargement of the neck (E. A. Wood). **Calcium Salts**, the Chloride in doses of gr. x–xx in milk after food, when glandular enlargement of neck and chronic diarrhea; the Phosphate of great use for sores (R); is of eminent service as a palliative (Wa). [See Sulphides below.] **Spongia Usta**, formerly held in high repute; has fallen into perhaps unmerited neglect; contains Sodium Iodide, Magnesium Bromide, Calcium Phosphate and Ferric Protoxide, all in small quantities (Wa). **Iron**, Ferrum and Calcium Phosphates combined give good results, also chalybeate waters (B); must be long continued (R). **Sulphides**, for sores, abscesses, suppurating glands; gr. $\frac{1}{20}$ or $\frac{1}{10}$ of Calcium Sulphide every hour or two (R). **Coniïne**, gr. ½ to ʒj of Almond Oil applied two or three times a day to conjunctivæ in scrofulous photophobia; has proved very successful (P). **Cod-liver Oil**, the best remedy to promote assimilation (B); of great service in the various manifestations of this disease (R). **Stillingia**, a domestic remedy, used with much success (B). **Capsicum**, in scrofulous and fistulous ulcerations, a weak infusion becomes a useful stimulant (P). **Mezereum**, strongly recommended (P). **Sarsaparilla**, useful by reason of its tonic and alterative properties (P). **Hyoscyamus**, the bruised leaves as cataplasm for scrofulous ulcers (P). **Prunus Virginiana**, is found very useful in the hectic (P). **Chimaphila**, holds a certain amount of reputation as a useful remedy (P). **Tussilago**, was employed by Cullen (P). **Gentian**, is valued; the infusion a useful vehicle for chalybeates, etc. (P). **Blisters**, for scrofulous glands (R). **Grape-cure**, renders much service (B). **Alcohol**, no doubt as to its great value; with Cod-liver Oil, or in small amounts at meals (Wa). **Phosphorus**, eminently serviceable in scrofuloderma, gr. x in Ol. Olivæ ℥j, doses of ♏v–x, thrice daily after meals (Broadbent). **Phosphates**, see above, under Calcium and Iron. **Aliment**, raw or broiled meat, the latter for children. Abundance of fresh air and sunshine. **Sea-air**, sunlight, moderate exercise, and light digestible food are necessary. [Compare CACHEXIÆ, COXALGIA, GLANDS, OPHTHALMIA.]

Scurvy.

Citric Acid, used with great advantage, though inferior to Lemon-juice (Wa). **Lemon- or Lime-juice**, of the utmost value, both as preventive and a curative agent; its efficacy believed to be due to its Potassium salts; Oranges are highly useful (Wa). **Acids**, especially Vinegar, to prevent scurvy, in the absence of lime-juice or fresh vegetables (R); dilute Muriatic Acid, gtt. v, thrice daily with juice of three lemons daily, vegetables and fresh meat (Da C). **Potassium Chlorate**, is probably a remedy of some value (Wa); is not (W). **Cinchona**, a decoction, or the dilute tincture with Myrrh or the Chlorates, a very useful gargle. **Quinine**, internally when much prostration, combined with mineral acids (Wa). **Alcohol**, diluted, as gargle (R). **Atropine**, hypodermically for salivation (R). **Alum**, a solution in water with Tinct. Myrrhæ ℥ss, several times daily as lotion for ulceration of the gums (W). **Liquor Sodæ Chloratæ**, ʒvj ad ℥xij aquæ, as a mild application to gums (Wa). **Dietetic Treatment**, alone required; Lemon-juice plays no essential part in the treatment; the full diet of an hospital, comprising fresh meat, vegetables, and milk, is generally sufficient. [Compare CANCRUM ORIS, PURPURA.]

Sea-sickness.

Antipyrin, is successfully employed. **Chloral**, the most effective remedy; gr. xv–xxx every four hours (R). **Staphisagria**, has given relief (P). **Creosote**, checks the vomiting (R). **Chloroform**, drop doses pure (R); ♏ij–v on sugar (B). **Atropine**, hypodermically, gr. $\frac{1}{120}$ in epigastrium, will relieve (B); gr. $\frac{1}{300}$ to $\frac{1}{200}$ given with **Strychnine**, gr. $\frac{1}{75}$ to $\frac{1}{60}$ hypodermically, is really specific in most cases, and in some if given before sailing, will prevent for the whole voyage, though but one dose be administered. **Bromides**, in full doses (Beard); the Sodium Bromide preferred, in doses of 30 grains thrice daily for 3 days before sailing and continued for the first 3 or 4 days of the voyage, is by far the most effective treatment and never produces evil effects (Rockwell). **Cocaine**, is quite efficient: the Hydrochlorate 1 in water 100, of which ♏iv–v on a bit of ice thrice daily (Otto); a 2 per cent. solution, as spray high up into nasal passages, is specific against nausea. [See under NAUSEA.] **Morphine**, gr. $\frac{1}{12}$ to $\frac{1}{6}$ hypodermically, will often relieve severe cases (B); often fails (Wa). **Amyl Nitrite**, by inhalation (B); is strongly recommended, but must be cautiously used. **Champagne**, iced; tablespoonful doses every quarter-hour (B). **Calumba**, a few drops of the tincture will sometimes relieve (B). **Spinal Ice-bag**, often successful (R). [Compare NAUSEA, VOMITING.]

Seborrhea.

Glycerin, especially useful; with Lead Acetate, Borax or Zinc, diminishing secretion; also acts efficiently when there is a want of sebaceous secretion (Wa). **Zinc Oxide**, ʒj, Plumbi Carbonat. ʒj, Cetacei ℥j, Ol. Olivæ q. s. Ft. unguent. (B). **Oleate of Arsenic**, is of benefit (Wa). **Mercury**, an ointment of the White Precipitate is serviceable on the scalp, with an occasional shampoo with tar soap or soft soap in solution, followed later by mildly stimulating lotions (Bulkley). [Compare ACNE, PITYRIASIS.]

Septicemia and Pyemia.

Quinine, only large doses, gr. xv–xx, are useful (B); supposed to diminish the temperature (R); to cinchonism, in childhood the best remedy (Wa); is probably the most useful medicine, given in full and frequently repeated doses (Haward). **Salicin**, to reduce the temperature in septicemia and to relieve the cerebral symptoms (R). **Salicylic Acid**, has decided value (B). **Potassium Permanganate**, is given with advantage, gr. ¼–gr. j thrice daily in distilled water (B). **Boracic Acid**, a saturated solution to wounds, ulcers, etc.; also Chlorine as disinfectant (B). **Oleum Caryophylli**, locally, also Oleum Gaultheriæ, Thymi, etc. (B); as antiseptics. **Sulphites**, may do some good in chronic cases, but the use of Sulphurous Acid has not given the results in man which Polli obtained from its use on animals (Haward). **Streptococcus Antitoxin**, has been used successfully [see page 182]. Antistreptococcic serum, 20 cc. in puerperal septicemia (Mapleton); also in acute hemorrhagic septicemia 3½ cc. every 4 hours, increased to 7 cc. after eight injections (Balance). **Saline Injections** of a quart of normal salt solution, $\frac{6}{10}$ per cent., into the subcutaneous cellular tissue, has given excellent results in acute septicemia (Lanphear); hypodermic injection fully as effectual as intravenous, used in 12 cases of which 10 recovered (Duret). **Water**, hot water as dressing for wounds, to avert pyemia, Hamilton's immersion plan (B); stumps to be immersed in warm bath (R); every wound, however slight, should be immersed in Bichloride solution, 1 to 10,000, as prophylactic, then dried with a sterile cloth and coated with collodion (Wyeth). **Aliment**, plentiful, with wine and good ventilation, are not to be neglected (Wa); concentrated food, milk and alcohol (Currier). **Stimulants** are necessary, brandy the best (Wa); Turpentine is a better stimulant than alcohol (B). **Abscesses** must be opened early, especially when in joints, to prevent pyemia.

Shock, Surgical.

Codeine, in large dose, gr. j, hypodermically, immediately after laparotomy, quiets pain, prevents intestinal contraction, and relaxes the tonic spasm of the vessels which forms the first stage of shock, shown by the small and rapid pulse, before the second stage, that of paresis of the vaso-motor system, sets in, as shown by the soft, compressible pulse; Morphine is the ideal relaxer of spasm, but has many objectionable qualities which Codeine is free from (Boise). **Amyl Nitrite** and **Glonoin**, relax arterial spasm, and are indicated in the first stage of shock. **Strychnine** hypodermically, is the best medicinal agent in the second or paretic stage of shock, when the vessels are relaxed and the pulse is soft and compressible; a full dose, gr. $\frac{1}{80}$, is necessary, and may be repeated in ½ hour (W). **Digitalin**, hypodermically, may also be of great service in the second stage. **Alcohol**, as Brandy or Whiskey, hypodermically or by enema, is commonly used; is harmful, being a vaso-motor paralyzer, encourages hemorrhage, increases restlessness and in large doses weakens the heart —Strychnine is far better (Estes). **Ether** as a stimulant is open to the same objections as alcohol (Id). **Heat**, is a potent preventive of shock; the room should be warmed to at least 72° F., exposed limbs should be wrapped in cotton batting, and hot water bottles wrapped in towels should surround the patient's body both during and after operation. **Hot Water**, as clyster, a pint injected into colon, and repeated as required, after laparotomy, in which operation the handling of the intestines sets up irritation of the sympathetic system, and is a potent cause of shock; this acts as a sedative thereto, and restores fluid to the blood, allaying thirst and supporting patient. **Normal Salt Solution**, consisting of ⅔ of one per cent. of Sodium Chloride in sterilized water, intravenously or subcutaneously to raise the volume of the pulse, stimulate the heart and restore volume to the blood, renders good service in the second stage of shock. Saline intravenous injections are inferior to saline rectal injections, the effects of the former being evanescent, but the latter are frequently used with most satisfactory results (Estes). The best fluid for injection into the cellular tissue is—Calcium Chloride 0.1, Potassium Chloride 0.75, Normal Salt Solution, 0.75 per cent. strength, 1 (Edes). Absorption from the cellular tissue is very rapid and the injection is not dangerous as is intravenous injection.

Sick-room.

Every home of any pretensions should contain a room especially arranged and kept ready for the use of sick members of the family. Such a room should be on the upper floor, and preferably in the south-east corner, so as to have the best sunny exposure; or still better, should be itself the upper floor of a two-story annex, separate from the main building, but joined thereto by a light, latticed bridge. It should have no upholstered furniture, a bare but painted floor, and rough-plastered and painted walls and ceiling, without pictures or paper, curtains or hangings. It should contain no sink, wash-basin, water-closet or any other convenience which connects with the sewers, but should communicate with the kitchen by a dumb-waiter, or have connected with it a smaller room, furnished with a gas-stove and the other requirements of a diet-kitchen. It should contain everything requisite for nursing a case of typhoid fever, scarlatina, diphtheria, measles or small-pox; and all its arrangements should be supervised by the family physician. The possession of such an appendage to the home would enable the owner to defy the mandate of a Health Officer, in regard to removing an inmate thereof to a public pest-house, as it could be shown to the satisfaction of any reasonable court, that a case of infectious disease could be better isolated and more humanely treated in such a room than in any "pest hospital" yet erected by our political administrators of health laws (Potter).

Sneezing.

Arsenic, a drop of Liquor Arsenicalis three times a day in paroxysmal sneezing, allied to asthma (R). **Potassium Iodide**, gr. x, several times a day (R). **Iodine** inhalations, in paroxysmal sneezing with itching of nose (R). **Camphor**, in incessant sneezing, with profuse running from eyes and nose; the powder should be snuffed, or the alcoholic solution inhaled (R). [Compare CATARRH, HAY-FEVER, INFLUENZA.]

Somnambulism.

Potassium Bromide, will give decided relief in the somnambulism of children allied to epilepsy, often with squinting, which may become permanent, generally the result of deranged digestion; the nightmare of adults will usually yield to the same drug (R). [Compare NIGHTMARE.]

Spasmodic Affections.

Aconite, externally and internally, for spasms not of a severe type (P). **Aconitine**, as ointment in the most severe, as well as in the milder local spasmodic affections; in angina pectoris, spasmodic asthma, cough, etc. (P); in spasmodic laryngitis has good effect (R). **Camphor** is said to relieve in many forms, as strangury, etc. (R). **Hyoscine**, is used with advantage in various spasms (Erb). **Belladonna**, of value for spasms of sphincter muscles, especially those of pelvic organs (P); Atropine hypodermically in local spasm (R). **Strychnine**, of great value in spasmodic asthma (P); also in tetanus, chorea, and epilepsy (Pf, S). **Veratrine**, as solution, brushed over lids once a day in painful spasmodic contraction of the orbicularis (Wa). **Opium**, very useful as an antispasmodic, especially if given with a stimulant, as Alcohol, Ether, or Chloroform (R). **Ipecacuanha**, in spasms of respiratory organs, of great value (P). **Chamomile Oil**, in spasms of hysterical persons, in 4 to 6 minim doses a very excellent remedy; also useful in pseudo angina pectoris (P). **Lobelia**, a valuable antispasmodic in cautious hands (P). **Lupulin**, in gouty spasms (P). **Tobacco**, in spasmodic asthma, and for relaxation of muscular spasms (P). **Sumbul**, is of use in gastric spasms (P). **Cardamom**, is usefully employed in gastric spasms (P). **Ammonia**, useful in children's colic (R). **Chloroform**, inhaled for intestinal spasm (P). **Sulpho-carbolates**, in flatulent spasm of women, usually a neuralgia of the abdominal nerves, the pain being excited by flatulence; act by preventing the formation of wind,—sometimes Phosphorus better (R). **Mustard Poultice**, an excellent counter-irritant in spasmodic affections (P). [Compare list of Antispasmodics on page 39, and in this section the titles ANGINA PECTORIS, ASTHMA, CHOREA, COLIC, CONVULSIONS, COUGH, CROUP, DYSURIA, EPILEPSY, GASTRODYNIA, HYDROPHOBIA, HYSTERIA, LARYNGISMUS, PERTUSSIS, STAMMERING, TETANUS, TORTICOLLIS, TRISMUS.]

Spermatorrhea.

Potassium Bromide, when due to plethora, erections normal, but persistent and teasing; is harmful in debilitated states, or daily losses (B); combined with cold sponging and the use of a hard bed (R). **Digitalis**, ʒj or ij of the infusion twice or thrice daily; few remedies are more successful in arresting spermatorrhea (R, P); when feeble erections, frequent emissions, cold hands and feet (B). **Cantharis** deficient tone of seminal vesicles, erections feeble, sexual feeling torpid; the tincture, gtt. ij–iij ter die (R); with Iron internally in emissions (R). **Phosphorus,** for the induced physical and mental debility; also, Hypophosphites of Lime and Soda (R). **Gelsemium,** as anaphrodisiac, may be combined with Belladonna or Cimicifuga (B). **Nux Vomica,** for relaxation and atony (B). **Strychnine,** in large doses, especially when impotence (R). **Quinine,** has been recommended (R). **Belladonna,** gr. ¼ of extract with gr. jss of Zinc Sulphate, three or four times a day, often successful in nocturnal emissions (R). **Atropine,** relaxed genitalia, no dream or orgasm (B). **Camphor Bromide,** has been useful (W). **Lupulin,** is a good anaphrodisiac; with Camphor, when a genital sedative is required (B). **Iron,** the Iodide, is useful in anemic cases (B). **Ergot,** beneficial in relaxed state (B). **Hydrastis,** is a useful injection, gtt. x of the fluid extract through a urethral tube to the prostatic portion of the urethro (B). **Cimicifuga,** useful in weak, relaxed conditions (B); when hypochondriasis exists it is very beneficial (P). **Hyoscine,** is a most useful remedy through its influence on the spinal centres (W). **Silver Nitrate,** a vesicating solution applied to perineum generally useful, and without danger (B); in solution, gr. xxx to the ℥, applied by urethral syringe to the prostatic portion of the urethra, is Lallemand's treatment, and still finds favor with many surgeons (Whitla). **Arsenic,** when from weak and relaxed seminal vesicles. **Kind Advice,** frequently the best treatment, as this affection is often due to the phantasms of a morbid imagination. **Bladder,** should be emptied after the first sleep. [Compare EMISSIONS, HYPOCHONDRIASIS, IMPOTENCE, also the List of Anaphrodisiacs on page 31.]

℞. Potassii Bromidi, . . . ʒj.
Sodii Bicarbonat., . . . gr. xv.
Infusi Digitalis, ... ℥ss.
Atropinæ Sulphat., . . gr. $\frac{1}{60}$.
M. Sig.—One dose, to be taken at bedtime. (*Gross.*)

℞. Tinct. Gelsemii, . . . ʒj.
Tinct. Belladonnæ, . . ʒij.
M. Sig.—15 drops thrice daily. (B.)

℞. Lupulini, ... gr. x.
Pulv. Camphoræ, . . . gr. vj.
Ext. Belladonnæ, . . . gr. ij.
M. ft. pil. no. xij. Sig.—One pill thrice daily. (B.)

℞. Tinct. Cantharidis, . . ʒij.
Tinct. Ferri Chloridi, . ʒvj.
M. Sig.—20 drops in water thrice daily. In impotence with spermatorrhea, of great utility. (*H. C. Wood.*)

Spina Bifida.

Iodine, injected into the sac, ʒss of tincture, or gr. ss, with Potassium Iodide gr. v, aquæ ʒj, has cured numerous cases (B); Iodi gr. ⅝, Pot. Iod. gr. ½ ad aquæ ʒj (Wa). **Collodion,** as a means of compression (B). **Bayer's Operation,** treats the tumor as if it were a hernia; he dissects out two lateral flaps from the skin covering it and removes the sac, leaving only two lateral flaps of the dura, which he sews together, afterwards bringing the skin and muscles together separately.

Spinal Concussion.

Lead-water and **Opium,** as lotion over the seat of injury (A). **Leeches,** if pain persistent (A). During the early stage the treatment of shock must be instituted, stimulants and restoratives being freely administered; traumatic neurosis may be treated with electricity, massage, hydropathy and the rest-cure; inflammatory symptoms require the treatment for acute or chronic myelitis (Lyman). [Compare MYELITIS.]

Spinal Congestion.

Ergot, gives excellent results (Brown-Séquard). **Turpentine,** as hot epithems, useful (Wa). **Antiphlogistic** measures, with rest and absolute diet; wet cups or leeches to the column ; cool affusions or ice-bags to the spine while patient is in a warm half-bath (Ros). [Compare MENINGITIS, MYELITIS.]

Spinal Irritation.

Aconite, as ointment locally (R). **Belladonna** preparations, locally, generally are better than Aconite (B). **Ignatia**, in small doses diminishes irritability of cerebro-spinal axis (Pf). **Strychnine**, persistently, will ameliorate wandering neuralgic pains due to irritability of nervous system (B). **Ergot**, large doses for congestion (Hammond). **Conium**, in functional derangement of the cord, with excessive irritability of the reflex function (Wa). **Firing**, sometimes very beneficial (B). **Electricity**, the inverse galvanic current gives much relief (Hammond). **Blisters**, with hot-water bag to spine, large doses of Strychnine, Phosphorus, Phosphoric Acid and Opium, are the methods based upon the anemic theory of the disease ; out of 156 cases so treated 133 were thoroughly cured (Hammond). [Compare MENINGITIS, MYELITIS, NEURITIS, NEURASTHENIA.]

Spinal Paralysis and Softening.

Ergot, to starve the inflammation by occluding the spinal arteries (Hammond). **Electricity**, best; galvanic current from spine to nerves and muscles (Ros). **Mercury** and **Potassium Iodide**, a thorough course, in spastic paraplegia when syphilis is suspected (O). **Massage**, with forcible flexion and extension and proper apparatus, to overcome rigidity and contracture in infantile spastic paraplegia, have often enabled a patient to get around comfortably (O). **Baths**, warm, of every description, are useful in spastic spinal paralysis (Lyman). **Suspension**, has been tried with some degree of success (Id). In softening the treatment must be palliative and supporting only (H). [Compare LOCOMOTOR ATAXIA, MYELITIS.]

Splenic Affections.

Mercury Biniodide, gr. j to ʒj of ointment, rubbed in before a hot fire, has given excellent results in chronic malarial enlargement of the spleen (Wa). **Quinine**, in simple malarial enlargement (B); gr. xv or xx or more daily, one of the most effectual remedies (Wa). **Ergot**, the most effectual remedy for enlarged spleen (Da C). **Ammonium Iodide**, effective in chronic splenitis, with Unguent. Hydrarg. Iod. Rubri externally; also small doses frequently repeated in all splenic derangements from malaria (B). **Iodine**, locally in chronic forms (B). [Compare LEUCOCYTHEMIA.]

Sprains.

Arnica, is very useful ; the infusion internally and externally (P); the tincture diluted as lotion is very effectual (Wa). **Aconite**, the liniment to painful sprains, often affords relief (Wa). **Turpentine**, as a liniment (P). **Ammonium Chloride**, in solution, as lotion, or with bread as poultice, to remove discoloration due to sprains (W). **Rhus Toxicodendron**, the tincture ʒss to Oj of water is a good application to sprains. **Oil of Bay**, as a stimulating liniment (P). **Cold Douche**, salt may be added ; the force must be regulated by the condition of the tissues (R). **Heat**, by fomentations alternated with cold affusions (D). **Rest**, is the most essential measure and should be perfect ; a roller bandage with splints may be required to secure the rest of the part.

Sprue.

Simaruba, the *Ailanthus glandulosa*, in large doses of a stronger decoction than usually prepared, has given satisfaction in some cases of dysenteric origin

(Mn). **Santonin**, the yellow form, gr. v in ʒj of olive oil, once or twice daily for a week, has given good results (Begg); tried without benefit (Mn). **Calcium Carbonate**, as powdered cuttle-fish bone or powdered crabs' eyes, two teaspoonsful at a time, after purgation by castor oil, also an aromatic tincture containing probably Simaruba and Opium; the method of a successful but irregular "sprue doctor" of Shanghai, who said that the object of his treatment was to remove the slime which coats the bowel (Mn). **Castor Oil**, as an aperient before commencing the milk-cure (Id). **Rhubarb**, the compound powder as an aperient occasionally, when relapses of diarrhea, sore mouth and flatulent dyspepsia (Id). **Silver Nitrate**, in solution by enema, for cases of dysenteric origin (Id). **Cocaine**, in solution, gr. v to the ℥, brushed over the painful mouth before taking food, relieves suffering (Id). **Borax**, a weak solution as mouth-wash after taking milk (Id). **Fruit-cure**, has given good results in Java; the diet must consist entirely of such fruits as are pulpy and free from coarse seeds, fibres, and excessive acidity, except pine-apple, which is interdicted (Van der Burg). **Milk-cure**, is by far the most successful treatment; at first not more than 60 ounces in the 24 hours, sipped through a glass tube in small quantities hourly. A ½ pint may be added daily after a few days, until 100 ounces are reached, and after 10 days more this may be increased gradually to a daily maximum of 6 or 7 pints. For 6 weeks after the stools become solid, and the mouth free from irritation, no other food should be permitted (Mn). **Kumyss**, sometimes agrees for a time when milk fails to give satisfaction (Id). **Diet**, after the above-mentioned six weeks, may be varied by a raw egg added to the milk; later, some artificial malted food, arrowroot or other digestible starch; still later, fish or chicken (Mn). **Meat-juice**, obtained by squeezing a pound of good beef-steak, cleared of fat and underdone, every 2 hours for 7 or 8 days daily, in those cases where milk does not agree (Macleod). **Hygiene**, the patient must never feel cold, and hence must dress warmly. He should not return to the tropics (Mn). [Compare DYSENTERY.]

Stains.

Silver Nitrate Stains may be removed by washing with Potassium Cyanide ʒijss, Iodine, gr. xv, Water, ℥iij; or, after moistening the spots, drop on them a few drops of Tinct. Iodine, and wash out with a solution of Sodium Hyposulphite, ʒss to ℥j (B). **Blood-stains**, if on dark-colored materials are best seen by an artificial light. After a few hours they become of a rusty, reddish-brown color, which they maintain for years. The microscope shows the characteristic corpuscles. These stains when on Iron are difficult to distinguish from rust; the latter is not soluble in water, while blood is extremely so. Heat applied to the metal will cause the blood to peel off, unless the stain has been exposed long enough to have rust mingled with the blood. A solution of blood in water, heated, forms a coagulum which is soluble in hot caustic potash, the solution thus formed is green by transmitted light, and red by reflected light. Menstrual blood cannot be distinguished from that resulting from a wound (Husband).

Stammering.

Vocal Training, the rhythmical method, the most successful, the chief end in view being to regulate the precipitate, irregular form of respiration; but long continuance necessary, six months, a year, or more, in special institutions (Ros). The patient must be taught the use of language anew, treated with especial kindness, and never subjected to mockery or punishment. [See *Potter on Speech and its Defects*, Lea Prize Essay, Philadelphia, 1882.]

Sterility.

Aurum, cures sterility when dependent on chronic metritis or amenorrhea, or coldness, more certainly than any other remedy; the Chloride, gr. $\frac{1}{30}$ (B).

Potassium Iodide, when due to syphilis (R). **Dilatation** of os and cervix carefully when sterility depending on obstruction, with dysmenorrhea (H). Sterility is frequently associated with uterine displacement (Meadows); less often with atresia. In persons of good health it may be caused by an acid discharge from the uterus, which kills the spermatozoa; for this Vichy water internally and per vaginam, also alkaline baths (Charrier). Is due to aspermatism of the husband in more cases than generally believed (Gross). Many cases are due to blocking of the cervical canal with a morbid discharge from the cervical glands, and such may be relieved simply by repeated cleansing of the canal with a cotton-wrapped probe or forceps.

Stings and Bites.

Quassia, a strong infusion used as a wash in Java on the mat-covered floors infested with fleas, the swarms vanishing as by magic (Neale). **Ammonia** or **Alkalies**, a weak solution, in stings of insects, to neutralize the formic acid (R); Ammonia, as nervine stimulant in snake-bites, more useful than brandy or any other stimulant; ♏x–xx of Liquor Ammoniæ in water or wine, every half hour or oftener; also externally or hypodermically, 1 in 2 of water into a vein (Wa). **Ammonium Carbonate**, gr. v hypodermically, as used for wounds by poisoned arrows. [See under WOUNDS.] **Carbolic Acid**, a weak solution sponged over the body, to keep off mosquitoes (R). **Salicylic Acid**, 1 to 19 of flexible collodion, locally for bites of insects; allays pain at once, and only in rare cases is the neighboring tissue swollen. **Mercury**, the Bichloride, 1 to 1000 of flexible collodion, is equally effective. **Potassium Permanganate**, in strong solution, 1 to 6 locally, is promptly efficient for all reptile-bites and insect-stings; if wound is small, make incision to enlarge it, and insert lint soaked in the solution; if a rattlesnake-bite, inject the solution hypodermically above the wound (Dupon). **Viola Cucullata**, the common violet, is used as an internal remedy in Pennsylvania for rattlesnake-bite, and is successful in a remarkable degree; the leaves are eaten, and a poultice of Indigo and salt is at the same time applied to the wound. **Arsenic**, 1 part to 5 of black pepper, is the Tanjore pill, highly esteemed in India for bites of venomous snakes (Wa). **Calcium Chloride**, a filtered solution injected into wound from snake-bite, successful in seventeen cases (Binz). **Silver Nitrate**, the sharpened stick applied to every sinuosity of the wound; excision safer (Wa). **Sugar**, applied to stings of wasps, said to relieve almost instantly (Wa). **Ipecacuanha**, as poultice or paste, allays pain or irritation; is regarded by some as almost specific (Wa). **Antivenene** [see page 183], is an effective antitoxin against the venom of several serpent species (Fraser). **Stimulants**, in snake-bites, freely, are most important; Liquor Ammoniæ the best (Wa); stimulants are indicated in snake-bites, but there is no remedy of any value therefor (Gross). **Sting**, should always be removed if left in the wound; pressing upon it with the barrel of a small key will expose it. [Compare WOUNDS.]

℞. Ol. Picis Liquidæ, Ol. Olivæ,
Ol. Hedeomæ, ... āā ℥j.
Spt. Camphoræ,
Glycerini, ... āā ℥ss.
Acidi Carbolici, ... ʒij.

M. Sig.—Shake well. Lotion against mosquitoes, for fishermen and hunters.

℞. Carbonis Vegetab., . . . ℔j.
Potassii Nitratis, ... ℥ij.
Acidi Carbolici, ... ℥jss.
Persian Insect Powder, . . ℥viij.
Mucil. Tragacanth., . . . q. s.

To make fumigating pastilles for use against mosquitoes.

Stomatitis.

Potassium Chlorate, locally and internally; large doses necessary, gr. x–xx; in ulcerative stomatitis of nursing women and aphthæ, of no value in mercurial form (R). **Hydrastis**, the fluid extract locally in mercurial and aphthous stomatitis (B). **Glycozone**, frequently applied, is of benefit in ulcerative stomatitis (Edson). **Carbolic Acid,** a concentrated solution in glycerin carefully, as a mild caustic in aphthous stomatitis (Wa). **Alcohol,** Brandy-and-water an excellent lotion (B). **Mineral Acids,** pure Hydrochloric applied on pine wood to ulcers (B). **Eucalyptus,** a decoction of the leaves, locally (B). **Glycerite of Tannin,** in ulcerative stomatitis (R). **Copper Sulphate,** solution painted over edges of gums in ulcerative stomatitis; generally dry Alum better (R). **Alum,** in ulcerative form, applied dry with the finger several times a day, especially when disease affects one-half the jaw (R). **Salicylic Acid,** to ease the pain of catarrhal stomatitis; one part, dissolved in sufficient Alcohol, to 250 parts of water (R). [Compare APHTHÆ, CANCRUM ORIS, SPRUE.]

Strabismus.

Belladonna, for the strabismus of encephalitis (P). **Atropine,** with strong convex glasses, to suspend accommodation for months, or years if necessary; may cure convergent strabismus in its earlier stages, in children of 3 years of age and younger (Green in C). **Operation,** required in most cases, especially when of congenital origin. **Glasses,** properly adjusted to sight, serve to strengthen the weak muscles in children, and to pull the axes right (Gould).

Strophulus.

Nitric Acid, Ac. Nitrici Dil. ʒss–j, Bismuthi Subnit. ʒss, Tinct. Digitalis ʒj, Glycerini ℥ss, Aquæ Rosæ ℥vij, applied to the affected parts frequently (Wa). **Zinc Oxide,** dusted freely over the part. **Magnesia,** or some other mild alkali, with improved feeding and aperients, to which measures this affection generally yields in infants. **Lancing** the gums is proper (H). [Compare LICHEN.]

Sunstroke.

Veratrum Viride, and **Gelsemium,** as sedatives, instead of stimulants, when the pulse is full and strong (Ely). **Water,** as cold affusion when the patient is stricken down unconscious (R); absolute rest and quiet, free air, loose clothes. **Potassium Bromide,** in cold water by enema. **Stimulants** when the pulse is frequent and feeble. **Chloroform,** if convulsions. **Leeching,** in the stage of reaction (Wa). [Compare HEAT-STROKE.]

Suppuration.

Sulphides, small doses, gr. ss–j, frequently repeated, are very serviceable (B). **Calcium Sulphide,** when ichor secreted instead of pus; also arrests suppuration, or if that is impossible will hasten maturation (R). **Quinine,** recommended in profuse suppuration (R); to sustain system when suppuration prolonged (B). **Sarsaparilla,** is very useful (P). **Phosphates,** Parrish's syrup to repair waste from suppuration (B). **Iron and Manganese Iodide,** the syrup in cachectic states resulting from suppuration (B). **Hydrogen Dioxide,** is a most energetic pus-destroyer; the solution may be applied in full strength, or diluted with an equal part of water. **Glycozone,** acts similarly but more slowly; after cleansing by Hydrogen Dioxide solution, the application of Glycozone stimulates healthy action and hastens the cure; for which purpose it has no superior in the entire range of therapeutics (Edson). **Bismuth Subiodide,** dusted over a suppurating surface after cleansing, is highly efficient as an antiseptic and a stimulant of healthy granulation. **Acetanilid,** is effective for 2 or 3 days, but ultimately fails to prevent suppuration (Foote); the following combination, used as a dressing, absolutely inhibits suppuration where it can reach the wound surface, and checks and quickly abolishes suppuration if that be already present,—Acetanilid, powdered, 48; Boric Acid, powdered, 15; Starch, powdered and finely sifted, 35; Carbolic Acid, liquid, 2. It should be changed twice daily as long as there is discharge to moisten it, when the wound becomes dry the dressing may be left on for days (Fallas). **Nuclein**, has been used successfully in suppurative disorders (Vaughn). [Compare ABSCESS, BOILS, CARBUNCLE, SEPTICEMIA.]

Surgical Fever.

Aconite, quickly and repeatedly administered in early stages, during chill or soon after, the safest treatment (P). **Salicylic Acid**, or Sodium Salicylate, especially useful as an antipyretic (B). **Chloral**, gr. xv–xxx every 2 hours; there is no better treatment (Wa).

Sycosis.

Nitric Acid, ℥j to Oj aquæ, as wash, used frequently (R). **Boracic Acid**, ʒjss finely powdered and incorporated with ℥j of Vaselin, is found most useful (Wa). **Salol**, as an antiseptic powder, has done good service. **Mercury**, Citrine Ointment has been extensively employed, also the Oleate of Mercury, both with good results (Wa). **Arsenic**, the Oleate, is found beneficial, and the **Solution of Arsenic** and **Mercury**, Donovan's solution, internally is highly useful. **Mercurial Ointments**, are extensively employed (Wa). **Sodium Sulphite** ʒj, Glycerin ℥j, Water ʒiij, locally, when of parasitic origin (Wa). [Compare CONDYLOMATA, MENTAGRA.]

Syncope.

Nux Vomica, in drop doses of the tincture every 5 minutes, to restore the cardiac action in extreme cases of syncope approaching heart-failure, especially when of neurotic origin; is promptly efficient (Macfarlan). **Cinnamon**, the Oil, as a powerful stimulant, is sometimes employed (P). **Alcohol**, as brandy or wine, when heart suddenly enfeebled from fright, etc. (R). **Amyl Nitrite**, in some forms, especially in anemic subjects, its inhalation speedily restores consciousness (O'Neill). **Atropine**, gr. $\frac{1}{100}$–$\frac{1}{40}$ subcutaneously, the best means of resuscitation, there being no medicine which so promptly exalts the force and rapidity of the heart's action (Harley). **Duboisine**, may be used instead of Atropine. **Ammonia**, internally, or breathed into the air-passages (R); the Carbonate as smelling salts (Wa). **Lavandula**, the compound tincture (Wa). **Chloroform**, internally, for hysterical people, as cardiac stimulant (R). **Position**, leaning forward, with head as low as possible (R). **Galvanization**, of the pneumogastric (B). **Cold Water** over the face, and volatile substances to the nose (B): cold affusion always (Wa). [Compare HEART AFFECTIONS.]

Synovitis.

Potassium Iodide, with Iron and Quinine, in syphilitic patients with constitution broken down (D). **Iodine**, in chronic synovitis, painted around joint; the solution injected into white swelling (R). **Quinine**, and free stimulation in all cases of pyemic synovitis, such as occurs in acute rheumatism of gonorrheal causation, occasionally in typhoid fever, and may result from a trifling injury in strumous subjects. **Mercury**, and **Morphine**, the Oleate locally (R); an elegant and efficient application (B); in syphilitic cases Mercury internally when acute symptoms have subsided (D). **Aconite**, for pains in inflamed joints (R). **Silver Nitrate**, locally to vesication almost, often very beneficial (Wa). **Carbolic Acid**, injected into joint (B). **Alcohol**, and water, equal parts, an excellent evaporating lotion (B). **Blisters**, a flying blister every night in chronic synovitis (R). **Cod-liver Oil**, in strumous cases (B). **Surgical Treatment**, splints to keep the limb motionless in all cases arising from injury; during acute stage splint should be fastened at some distance above and below the joint, not touching the joint itself; straight position, leeches *to* the joint, or cupping *near* it; ice, evaporating lotions or hot fomentations; blisters inapplicable until the acute stage subsides (D): if suppuration occurs the joint must be dealt with as any other abscess cavity (MacCormac). **Heat**, as fomentations or poultices in the acute form. The results of dry heat, applied by the Tallerman apparatus seem almost marvelous in traumatic synovitis, whether in baseball men or other persons (W). **Bandage**, or **Strapping**, to cause absorption of fluid; bandage with cold water after alternate bathing with hot and cold water, in chronic synovitis. [Compare COXALGIA, JOINT AFFECTIONS.]

Syphilis.

Mercury, the mainstay in the earlier and later stages; the **Protiodide** in pills of gr. ⅙ each, one after each meal increased by one every third day, until teeth get sore or bowels disordered, then drop two pills from each dose (Keyes); the best remedy for primary and secondary forms, not in tertiary; small doses are best, stopping short of ptyalism (B); Blackwash, Calomel, or Citrine Oint. very useful in mucous sores, tubercles, and elevated indurations; in syphilitic ozena, psoriasis, rashes, condylomata, etc., the Bichloride, gr. ij–v in ℥j of Alcohol, painted over syphilitic mouth lesions daily (Keyes); Mercury is believed to be a true vital antidote against the virus (R); used for at least two years can eradicate it (Keyes): internal administration best because most practicable; the two great preparations are the Bichloride and Protiodide (Fournier): by intramuscular injection, which method offers many advantages in army practice [see page 344 for formula], and has given me the very best results (Lambkin). **Nitric Acid**, in secondary forms (R); holds a high place as an internal remedy (Wa); when sponginess of gums excessive, ʒiv to ℥ij aquæ, teasp. 4 times daily; also use locally (St); as cautery for the initial lesion, the fuming acid, if used at all, should be applied early and thoroughly, followed by Blackwash locally on lint (Bulkley). **Potassium Iodide**, is approached by no remedy in constitutional syphilis; also for mercurial cachexia, syphiloma of nervous system, and many disorders of syphilitic origin; will certainly arrest ulceration of nares, palate, etc., if given in large doses, gr. xx–ʒj every 4 hours (R); is of little value in early stages; in the later should be combined with Mercury (St). **Rubidium Iodide**, is more pleasant than Potassium Iodide, having a milder taste, and is born far better, especially by the stomach and in regard to the production of iodism and cardiac difficulties (Neisser); is indicated in patients in a low state, with weak cardiac activity (Mering); in doses of ℥jss to ℥iij of a 5 per cent. solution daily, gave the best possible results without troublesome disturbances (Bunge). **Iodine**, as gargle for ptyalism; the tincture applied to syphilitic sores of the throat (R); or ℥ss of tincture to ℥iv Syr. Fusci., a teaspoonful well diluted ter die, after meals, when Potassium Iodide can not be borne (St). **Iodoform**, powdered and dusted over ulcers (B).

Aurum, after Mercury and the Iodides, in old cases of secondary and tertiary, ulceration of the throat, ozena, phthisis, syphilitic bone-diseases (B); its beneficial action incontestable (Tr); the Bromide of Gold and Arsenic has rendered good service in trifacial neuralgia diagnosed as due to syphilis (E. A. Wood); Gold is unquestionably useful in the later stages, its best effects being obtained with very small doses (Pf): the Bromide of Gold, Arsenic and Mercury (Mercauro) is highly praised in the late manifestations of syphilis, especially in those affecting the nervous system. **Stillingia**, with Nitric Acid in chronic cases of broken-down constitutions from abuse of Mercury and Iodides has been most satisfactory (B). **Cascara Amarga**, is said to have remarkable powers as an alterative in syphilis, but to be useless if alcohol and tobacco are used at the same time. **Sanguinaria**, in secondary and tertiary forms is held to be very useful (P). **Sarsaparilla**, a most important remedy, as adjunct to, and in abuse of Mercury (P); with Guaiac and Mezereon, as the Compound Decoction of Sarsaparilla, in tertiary form (B). [See Guaiac, below.] **Bella-**

donna, with Mercurial Ointment, for secondary ulcerations of rectum (P); the tincture ʒiv ad ℥ij aquæ, a teaspoonful 4 times a day in water, instead of mercurials (St). **Iron**, the Iodide in constitutional syphilis, to promote constructive metamorphosis (B); where anemia exists (R); the Potassio-Tartrate, gr. xv–xx, every 4 hours, especially in the gangrenous form (Otis). **Guaiacum**, in tertiary syphilis only, or as vehicle for Potassium Iodide and Mercuric Chloride (B). **Carbolic** and **Salicylic Acids**, locally to syphilitic abscesses, Carbolic best (B). **Zinc Chloride, Iodide, Nitrate**, locally to syphilitic ulcers (R). **Syphilis Antitoxin**, has been used with encouraging results [see page 183]. **Denutrition**, the Arabic "hunger-cure" efficient, but unpopular (B). **Turkish Baths**, or wet packing, ameliorate and aid the cure of constitutional syphilis (B). **Hygiene**, is of the greatest importance in syphilis (Bulkley). **Cod-liver Oil**, remarkably improves condition resulting from prolonged use of Mercury and Iodides, the syphilodermata, and squamæ; internally and by inunction (R). [Compare CHANCRE, CONDYLOMATA, PTYALISM, ULCERS.]

℞. Hydrarg. Iodidi Rubri, . gr. iij.
Potassii Iodidi, ... ʒ iij–vj.
Tinct. Aurantii Cort.,
Syrup. Aurantii Cort., aa ℥j.
Aquæ, ... q. s., *ad* ℥ viij.
M. Sig.—A teasp. thrice daily after meals. (*Otis, for the Mixed Treatment.*)

℞. Hydrarg. Bichloridi, . . gr. iv.
Tinct. Benzoini, ... ℥ ss.
Aquæ Cologniensi, . . . ℥ j.
Aquæ Rosæ, ... ℥ ivss.
M. Sig.—Apply locally with sponge to skin for 20 minutes. For squamous syphilides. (*S. W. Gross.*)

℞. Massæ Hydrargyri, . . gr. ij.
Ferri Sulph. Exsiccat., . gr. j.
Extr. Opii, ... gr. ¼.
In pill, thrice daily. (*Otis.*)

℞. Hydrargyri Bichloridi,
Ammonii Chloridi, . . aa gr. iij.
Tinct. Cinchonæ Comp.,
Aquæ, ... aa ℥ iij.
M. Sig.—A teasp. thrice daily. Each ʒ contains gr. $\frac{1}{16}$ of Corrosive Sublimate. (*Bumstead.*)

℞. Hydrarg. Iodidi Rubri, . gr. ij.
Ammonii Carbonatis, . . gr. xx.
Potassii Iodidi, ... ʒ iij.
Tinct. Gent. Co., q. s., *ad* ℥ iv.
M. Sig.—A teasp. in water after each meal. (*Fox, for the Mixed Treatment.*)

℞. Hydrarg. Chlor. Mitis,
Lycopodii, ... aa ʒ ij.
M. Sig.—Use as snuff thrice daily, in lesions of the nostrils. (*Diday.*)

The Three Eights.

℞. Hydrarg. Chlor. Corr., . gr. viij.
Potassii Iodidi, ... ʒ viij.
Syr. Sarsaparillæ Co., . ℥ viij.
M. Sig.—A teasp. thrice daily.

℞. Potassii Iodidi, ... ʒ ij.
Ammonii Carb., ... ʒ ss.
Tinct. Cinchonæ Comp., ʒ iv.
Glycerini, ... ℥ j.
Syr. Aurantii Cort., . . ℥ jss.
M. Sig.—A teasp. in plenty of water after each meal. (*Keyes.*)

Tabes Mesenterica.

Calcium, the Chloride and Phosphate (R); the former is a powerful remedy if kept up (Wa). [See under SCROFULOSIS.] **Iodine**, with Cod-liver Oil by inunction (El); locally over glands; carefully, lest inflammation be increased (R). **Potassium Iodide** in small repeated doses, valuable (Wa). **Mercury**, Corrosive Sublimate with bark; gr. j ad ʒij Tinct. Cinchonæ, after meals, for chronic glandular disease (D). **Phosphates**, for malnutrition (B); the Hypophosphites act slowly but surely (Wa). **Iron** and **Iodine**, in various forms are the most useful remedies in scrofulosis, but medicine is powerless without strict hygienic measures (A); the Iodide or Phosphate of Iron and Cod-liver Oil, as for tubercle elsewhere (El). **Fel Bovinum**, is worthy of trial, though at best a palliative (Wa). **Cod-liver Oil**, is the best remedy to promote assimilation (B); of great service (R). **Chaulmoogra Oil**, is of benefit, used by inunction (Wa). **Aliment**, raw meat, cream, chocolate, and cocoa, are valuable nutriments in these cases (El); peptonized foods are of inestimable value (Wa). **Hygiene**, change of air, especially to sea-air, is all-important (El). [Compare SCROFULOSIS.]

Taste, Disordered.

Mercury or Podophyllin, as purgative for cankery taste unconnected with alcoholism; or half-glass of pure cold water daily half an hour before breakfast (R); ⅓ gr. of Gray Powder 3 or 4 times a day will generally remove the disagreeable taste in the mouth due to dyspepsia, in the course of chronic disease or in early convalescence from acute illness (R). **Electricity**, **faradization** as a stimulant of the nerves in the tongue, may aid the recovery of function when loss of taste is due to nerve disease (Gowers).

Teeth.

Potassium Iodide, in doses of gr. x, thrice daily, often cures looseness of teeth from periostitis of alveolar processes (Wa); **Iodine**, the tincture painted over gums close to the teeth when the gums begin to recede; also to remove tartar (R). **Cinchona**, powdered bark often used in tooth-powders (R). **Collodion**, on cotton, as filling for carious teeth (P). **Liquor Sodæ Chloratæ**, ʒvj and ℥xij aquæ, a highly useful application in fetid discharges from carious teeth (Wa). [Compare DENTITION, GUMS, ODONTALGIA.]

Temperature in Disease.

Average Normal Temperature, of adults, 98.6° F.; of children, 99°; of the aged, 98.8°. Diurnal variation 1° to 1.5° F., highest from 9 A.M. to 2 P.M. Above 108° F. is a fatal sign, which issue may be averted by cold baths, reduced by ice from 96° to about 60° F. (A). The clinical thermometer placed in the mouth, axilla or rectum, and retained *in situ* for five minutes, should go hand in hand with Aconite in the treatment of inflammations (R). [For Antipyretics see the articles on FEVER AND INFLAMMATION, also the list of these agents on pages 37 and 38.]

Clinical Thermometry is one of the principal means of positive diagnosis. The thermometer should be self-registering, certified, and accurately marked according to the Fahrenheit scale. The most reliable temperature is that in the rectum or vagina; less so in the axilla and folds of skin, and still less reliable in the mouth. A correct reading of the thermometer cannot be obtained in less time than five to seven minutes (Da Costa).

The Average Normal Temperature of the body is 98.6°, which, like the pulse, will vary somewhat in individual cases; as a general practical result it is agreed that in temperate regions the normal temperature at completely sheltered parts of the surface of the human body amounts to 98.4° Fahr., or a few tenths more or less; and a rising above 99.5°, or a depression below 97.3° F., is a sure indication of some kind of disease, if the increase or depression is persistent. The temperature is increased at the prime of life, is raised and depressed temporarily by the influence of diet, stimulants, exercise, etc. The minimum diurnal temperature is observed at 2 A.M., the maximum at 4 to 6 P.M. The greatest recorded range of temperature in disease is 50.4°; the minimum is 71.6° in a case of sclerema neonatorum (Quain's Dict.), the maximum 122°. In severe and fatal cases it rarely exceeds 107°, and rarely falls below 92°, even in fatal collapse. It may rise 3° to 4° after death, as observed in a case of typhoid fever in which death occurred with a temperature of 107°, which increased shortly afterwards to 110.5°. A temperature of 107° indicates malignancy, and when met with for two consecutive days in typhus, scarlatina, measles, pneumonia, pyemia, meningitis or rheumatism, death may be expected shortly. In relapsing, remittent and intermittent fevers, and in the initial chill of an abortion, the temperature may reach 107° without indicating great danger. During the last hours of life in many diseases, the temperature rises to 109°–111°; for example, in tetanus, sunstroke, typhus, etc. With a temperature of 96° collapse is imminent.

Abnormally High Temperatures reported in the British Medical Journal, by Dr. Donkin, include those of eight cases, all but one in females, and none proved fatal. Pain was a prominent symptom in all. (1) 111.6°; convalescing from enteric fever. (2) 108°; no organic lesions; ovarian pain. (3) 115.8°; great abdominal pain and excitement. (4) 111°; convalescing from enteric fever. (5) 113°; enteric fever and double pneumonia. (6) 112°; synovitis; this was the only male. (7) 112°; painful stump, with necrosis. (8) 117°; pyonephrosis. Dr. Jacobi of New York reported a case of injury in which the temperature taken in the mouth, axillæ, rectum and urethra, before many witnesses and with many thermometers, was 148° F. and yet the patient did not die. Dr. Welch mentioned as a well-known case, one Galbraith of Omaha, in whom the temperature went to 171° F. for some hours.

High Average Temperature (above 104°), is found in severe pneumonia, scarlatina, remittent, typhus, typhoid and relapsing fevers, pyemia, etc. Moderate High Temperature (102° and above), is seen in peritonitis, acute rheumatism, pericarditis, pleurisy, dysentery, cerebro-spinal meningitis, catarrhs, etc. A temperature of 100° and above is found in chronic affections, incipient inflammations and mild fevers. When, in effervescence, the heat increases rapidly, it will in defervescence decline proportionately fast and *vice versa.* Look for a grave affection when high temperature is of continuous type. A distinct interval between the morning and evening temperature is a favorable sign. A slow and gradual increase indicates typhoid fever; in rheumatism and anomalous fevers the increase is more rapid, and still more so in acute inflammatory disease, as pneumonia, pleurisy, typhus, scarlatina, rubeola, etc. The rise is usually rapid in intermittent fever, febricula, and ephemeral fevers. A rapid effervescence and slow defervescence indicates some complication of disease; the reverse order indicates great danger. When the temperature begins to fall from the evening to the morning, it is an indication of improvement; while a rise of temperature from the evening to the morning is a sure indication that the patient is worse. Stability of temperature from morning to evening is a good sign, but from evening to the morning is unfavorable.

Decrease of Temperature below the normal point is rare. It occurs sometimes transitorily, announcing a favorable crisis, by preceding the return to the normal temperature. It is also met with occasionally during the morning remission of remittent fever; also during the apyrexia of intermittents; in acute collapse, preceded or not by fever; in chronic wasting diseases, and sometimes also on the approach of death, especially in typhus fever.

In Phthisis, the temperature is higher in the evening than in the morning; later, higher at early bedtime than at noon, and high again at dusk. This is a valuable and delicate test of the progress of tuberculization.

In Typhoid Fever, the accession is by a rise of one degree each day, with the diurnal variation. If the evening temperature does not exceed 103.5°, the disease will probably be mild; but a temperature of 105° in the evening indicates a severe type and much danger. A sudden reduction to 95° in the third week denotes intestinal hemorrhage; a lingering temperature of 101°–102° in the fourth and fifth weeks indicates non-cicatrization of the intestinal ulceration.

In Scarlatina, the rise of temperature is rapid, 104.7° may be reached in a few hours and 105° by the second day. It seldom rises above 105° and almost never above 106°; is continuous until the eruption begins to fade, when remissions take place unless complications arise.

In Measles, 103° is the usual temperature, with daily variations, increasing with the eruption and catarrhal symptoms. A high temperature lasting beyond the tenth day denotes complications.

In Diphtheria, the temperature by the end of the third day will, in uncomplicated cases, not exceed 103°–104°. It falls temporarily when the exudation appears. Defervescence occurs in the severe but favorable cases, from the twelfth to the fourteenth day; in the milder cases not before the sixth. In some fatal cases it occurs early, from the third to the fourth day. In asthenic cases the temperature of the surface falls, while that of the interior remains high, 100° in the axilla and 103° in the rectum. During convalescence, the temperature is low and readily depressed, but may be raised by intercurrent maladies. Any increase after the first five days, or a continuous high temperature after the first ten days, is unfavorable. A sudden rise may indicate complications.

Co-Relation of Pulse and Temperature.—As a general rule the co-relation of pulse and temperature may be stated as follows, namely:—an increase of temperature of one degree above 98° F. corresponds with an increase of ten beats of the pulse per minute.

Testicles.

Mercury, the ointment, locally in indurations and enlargements of testes (Wa); Corrosive Sublimate, with Cinchona or Sarsaparilla in sarcocele (D). **Camphorated Naphtol,** used hypodermically in tuberculosis of the testis with very gratifying results (Reboul). **Aurum,** is highly recommended in hypochondriasis accompanying testicular disease, and as a tonic for low-spirited, pining boys with undeveloped testes. **Water,** cold applications in neuralgia of testes with tonics and neuralgic treatment generally (D). **Suspensory Bandage,** with rest, in many affections of the testes (D). [Compare HYDROCELE, ORCHITIS, VARICOCELE.]

Tetanus.

Potassium Bromide, not less than ℥ss during the day, with Chloral at night as a hypnotic; out of 21 cases so treated but 3 died; its physiological action indicates it to be the best remedy known (W); in very large doses, ʒj every 3 or 4 hours, has given better results than any other remedy (B). **Chloral,** in full doses, gr. xx, no remedy more effectual (B); has sometimes cured (R); best used in combination with Potassium Bromide (W). **Chloroform,** in small and frequently repeated inhalations, also by friction, has been useful in many instances (Wa); anesthetics give temporary relief (B); four cases of acute tetanus treated successfully by chloroform inhalations, the daily dose varying from ʒij to iv (Preobrajensky). **Paraldehyde,** promises well, in full doses, ʒij–ijss; does not depress the heart, as chloral and the bromides do (B). **Strychnine,** of decided service (P); cured 8 cases of traumatic form in doses of gr. $\frac{1}{16}$ to $\frac{1}{8}$ (S); the evidence as to its curative power is of doubtful credence, but it is most successful in spontaneous and chronic cases rather than in the traumatic form (B). **Aconite,** has benefited many cases (P); its success warrants further trial (W). **Belladonna,** successfully used in many cases; the extract internally, and locally to wound (Wa); Atropine, gr. $\frac{1}{125}$ injected into muscle (B); bleeding, vapor-baths, and large doses of Belladonna have cured tetanus (Tr). **Nicotine,** by rectum or hypodermically, appears to be useful in many cases (R); much evidence for it as the best remedy (P); effective but dangerous (B); Physostigma better (Wa). **Physostigma,** has been used with excellent results (P); the fluid extract by mouth if possible, at the very beginning, and must be pushed until just short of arresting breathing (B); evidence is discrepant (W). **Apomorphine,** may prove antagonistic (P). **Curare,** hypodermically, has much evidence for its power (P). **Cannabis Indica,** used with marked success in traumatic form (P); it is difficult to obtain an active extract

(W). **Cocaine**, and morphine, of each a 5 per cent. solution, 3 syringesful hypodermically, immediately relieved and finally cured a bad case of idiopathic tetanus unrelieved for 3 days by chloral, morphine, etc. (Lopez). **Gelsemium**, has cured several cases (P); its spinal action is opposed to that of tetanus (B). **Hyoscyamine**, or **Duboisine**, gr. $\frac{1}{32}$ gradually increased to gr. $\frac{1}{16}$, is very efficient (Oulmont). **Antipyrin**, antagonizes excitability of the motor nerve centres, and has been used with benefit. **Amyl Nitrite**, used in 3 cases with marked benefit as spinal sedative (W); has been used with success (R). **Morphine**, hypodermically, deeply into tetanized muscles, and if possible to the point of entrance of the nerves, used with successful results (Demarquay); as ordinarily used is of no value (Wa). **Tetanus Antitoxin**, is unquestionably the most efficient remedy known for this disease [see page 180]. **Conium**, is indicated, but has not been successful (B). **Water**, as warm baths, and cold, or ice, affords only temporary amelioration (B). **Spinal Ice Bag**, extremely useful (R). **Division**, or stretching of any nerve-trunk connecting the wound with the spinal cord. [Compare SPASMODIC AFFECTIONS.]

Thirst.

Acid Drinks, allay thirst by promoting the secretion of the alkaline saliva; but excessively used will derange the stomach (R). **Bitters**, in drinks with acids slake thirst most effectually (R); a weak infusion of Cascarilla or Orange-peel, acidulated slightly with HCl acid, an efficient thirst-quelling drink for fever patients (Graves). **Ice**, sucked, is very grateful, and allays thirst in fevers (R). **Tepid Drinks**, are useful in the thirst of diabetes (Prout). **Fruit Juices**, or these made into drinks, but the most harmless agents must be used in moderation, and their consumption has to be checked, otherwise patients will take them to excess and may thus do themselves considerable injury (Fenwick).

Throat, Sore.

Aconite, when temperature high, half-drop doses of the tincture, every ¼ hour for 2 hours, then every hour, will almost certainly prove efficacious (R); valuable in ordinary sore throat (P). **Belladonna**, is very admirably adapted to the treatment of ordinary sore throat; when much fever combine with Aconite (R, P). [See under CATARRH, ACUTE.] **Nitre**, dissolved in mouth, to abort a sore throat (Wa). **Tannic Acid**, as powder, gargle, spray (P); the Glycerite of Tannin, after acute inflammation; in ulceration of aphthous sore throat daily when tendency to catarrh (R). **Ipecacuanha**, the wine as spray, in non-inflammatory sore throats and hoarseness from congestion of vocal cords (R). **Capsicum**, ʒj of tincture to O½ aquæ as gargle, in some sore and malignant sore throats (R, P). **Potassium Chlorate**, in grain doses every half-hour (Smith). **Alum**, dry, or in solution (R). **Myrrh**, as gargle in ulcerated sore throat (P). **Guaiac**, the compound guaiac gargle [see page 576] is often very efficient in simple sore throat and commencing tonsillitis. **Chloral**, internally and locally, is an excellent remedy for ulcerated sore throat (Brodnax). **Cimicifuga**, in simple sore throat (P); also in malignant forms when the mucous membrane is dry and spotted with inspissated mucus (R). **Mercury**, in acute tonsillitis, which see (R); the Bichloride as a gargle [formula on next page], in ulcerated forms of syphilitic sore throat (Sir Chas. Bell). **Rhus Glabra**, a decoction, ℥j to Oj boiled to O¾, with Potassium Chlorate ℥ss, is a very efficient gargle (W). **Arsenic**, in medicinal doses, for sloughing of throat or malignant sores (R): the Iodide is an excellent remedy for the so-called diphtheritic sore throat, gr. iij triturated with gr. xx of sugar of milk, one-half of which is dissolved in ℥iv of water, and a teasp. given every hour or so. **Methylene Blue**, in simple, non-diphtheritic ulceration of the throat, patients would express themselves with delight as being cured, after one or two applications of the solution (Rose). **Iodine**, the tincture, locally to sores, whether syphilitic or not (R). **Nitric Acid**, undiluted, to sloughs (R). **Silver Nitrate**, locally, in early stage of inflammation, may cut it short (R). **Sulphurous Acid**, by inhalation, spray, or fumigations for malignant sore throat, scarlatinal or otherwise (R). **Water**, cold compress nightly, to harden the throat when tendency to catarrh (R). **Ice**, constantly sucked (R). [Compare DIPHTHERIA, PHARYNGITIS, TONSILLITIS; also the formulæ for Gargles on page 576.]

℞. Tinct. Guaiaci Ammon.,
Liq. Potassæ, ... aa ʒ iij.
Tinct. Opii, ... ℥ ij.
Aq. Cinnamomi, q. s. *ad* ℥ viij.
M. ft. gargarisma.
Sig.—To be used as a gargle, every hour, in clergyman's sore throat. (*Garner.*)

℞. Hydrarg. Bichlor., . . . gr. iv.
Alcoholis, ... ℥ ij.
Solve, et adde—
Decocti Cinchonæ, Mellis Rosæ,
Tinct. Myrrhæ, . . . aa ℥ ij.
M. ft. gargarisma. Sig.—Gargle, to be diluted if too severe. (*Sir Chas. Bell.*)

Tic Douloureux.

Croton-Chloral, has special effect on the 5th nerve (B); is palliative in doses of gr. v every ½ hour till gr. xxx are taken (W). **Salicylates**, in large doses, cured a case of 12 years' standing. **Stramonium**, gr. ¼ to ½ of the extract every 3 or 4 hours for 4 or 5 doses, often affords decided relief; stop if narcotic symptoms appear (P). **Arsenic**, cures by influencing nutrition (B). **Phosphorus**, is useful in doses of gr. $\frac{1}{100}$ to gr. $\frac{1}{12}$ every 3 hours (R). **Morphine**, with Atropine, hypodermically, gives relief (B). **Aconitine**, has lately been given with good results (B). **Antipyrin**, and **Acetanilid**, are sufficiently analgesic to relieve the pain in many cases. **Iodides**, are promptly curative when tic is due to syphiloma of the nervous system, the pain being nocturnal chiefly (B). **Cimicifuga**, is frequently very effective (B). **Turpentine**, when rheumatic in origin or produced by fecal accumulations (B). **Quinine**, holds a foremost place in the list of remedies (Wa). **Ammonium Chloride**, in doses of 30 grains 4 times daily, is of great service in numerous cases, especially when the pain partakes more of a rheumatic than of a neuralgic character (Sir Thos. Watson). **Cannabis Indica**, gr. ¼ to ½ rarely gr. j, of a good extract, is very effective and ranks in value next to morphine and atropine (Reynolds). **Physostigma**, a few drops of a solution of the extract, 1 in 30, or one or more gelatine discs of Physostigmine introduced within the eyelids of the affected side, effectively relieved or cured several cases (Munro). **Chloroform**, the liniment applied with friction is sometimes serviceable (Wa); a few drops by deep injection in the vicinity of the nerve trunk (B). **Galvanization** of the fifth nerve, gives decided relief to the pain, and frequently results in permanent cures in cases which belong to the category of the so-called essential neuralgiæ (B). [Compare HEMICRANIA, NEURALGIA, NEURITIS, ODONTALGIA.]

Tinea Circinata—Ringworm of the Body.

Mercury, the Bichloride, 1 part in 250 of water, as parasiticide application, after depilation (A); Calomel, as ointment, ʒj to the ℥, is useful (B); strong Citrine ointment rubbed in twice daily is often effectual (Wa); the ointment of the Red Oxide often cures ringworm on the body or limbs when other remedies fail (Wa). **Carbolic Acid**, ʒj to the ℥ of glycerin, or equal parts of each, is a very efficient application (B). **Boric Acid**, is an excellent topical application, especially in that form affecting the scrotum and inner side of the thigh (Watson). **Copper Acetate**, in ointment, gr. x to the ℥, is a very effective application (B). **Sulphites**, are used in parasitic skin diseases to destroy the parasites (B). **Sulphurous Acid**, is better than Carbolic and safer (A); must be fresh to be of use (Bulkley). **Cocculus Indicus**, the decoction locally, after washing the skin well (P). **Oil of Cade**, the best depilatory known (A). **Arsenic** will not cure, but may do service as a nerve tonic or an improver of nutrition, in connection with other remedies (Bulkley). **Iodine**, as liniment once applied (R); with Oil of Tar, 1 to 4, is excellent (Wa). **Kamala**, used locally by the Hindoos (P). **Tar Ointment**, is used with good effect (P). **Acetic Acid**, strong, applied to ringworm of any part of the body except the scalp; no treatment is easier, more speedy or certain in its action (R). **Sodium Chloride**, common salt in ointment is a very effective remedy [see under TINEA TONSURANS]. **Cod-liver Oil**, is a powerful auxiliary in weakly and cachectic subjects (Wa). **Diet and Hygiene**, are important; the food should be nutritive and abundant, especially animal fats; daily baths, out-of-door exercise. **Fungus**, is the *Trichophyton tonsurans* (A).

Tinea Decalvans—Alopecia Areata.

Parasiticide Lotions, must be used after epilation and washing of head daily with soft or black soap. **Collodion**, with Cantharidal Ether, equal parts, as a stimulant after the fungus is destroyed (A). **Oxygen**, locally applied to the scalp by a close-fitting rubber bag, to restore the hair [see under ALOPECIA]. **Tonics**, are necessary, especially for the nervous system (Bulkley). **Fungus**—the *Microsporon Audouini* (A); but I have never seen it, though having made repeated and thorough searches (Bulkley).

Tinea Favosa—Favus.

Mercury, is efficient when used early; the Bichloride, gr. xx to ℥j of simple cerate (B); or gr. ij to the ℥ of water applied after each epilation (R). **Myrtol**, is curative of favus (B). **Carbolic Acid**, in glycerin or cod-liver oil, as a local application (B). **Sulphurous Acid**, as a parasiticide; Acidi Sulphurosi Dil. ℥ss, Sodii Hyposulphitis ℥iij, Aquæ q. s. ad ℥xvj (Startin); is useful in favus, but when cases are unusually obstinate its action should be assisted by epilation (R). **Simple Oils**, to soften and facilitate the removal of scabs (R). **Poultices**, are useful preparatory to epilation (R). **Iron**, the tincture of the Chloride, internally in doses of ♏x thrice daily for a child ten years old; combined with cod-liver oil if the disease is associated with scrofula (Sir E. Wilson). **Sulphur Iodide**, in weak ointment, gr. xx to the ℥, well rubbed in after removal of crusts, is the most reliable preparation of its class (Whitla). **Epilation**, must be resorted to and carried out with care and patience (Id). All the remedies useful for ringworm of the scalp may be used against favus, and success depends rather upon the judicious way in which these agents are used one after the other than on the persistent use of any one of them (Id). It is clearly demonstrated that the disease is conveyed from the mouse to the cat and then to the children who play with the affected cat (Id). **Fungus**—the *Achorion Schönleinii* (A); a very rare affection in this country (Bulkley).

Tinea Imbricata—Tokelau Ringworm.

Iodine, the double strength liniment, freely applied, is the best treatment for natives (Mn). **Chrysarobin**, as ointment, gr. xx to the ℥ of vaselin, for limited patches (Id); [see under DHOBIE ITCH]. **Cassia Alata**, the bruised leaves well rubbed in over the affected area (Id). **Sulphur**, as fumes or ointment, acts very slowly and unsatisfactorily (Id). **Oiling the Body**, is believed to be a preventive (Daniels). **Cleanliness** of the skin and boiling or destruction of the clothing worn next it, to prevent recurrence (Mn). The disease is a form of body ringworm peculiar to certain eastern tropical climates, is produced by a *trichophyton*, and is characterized by a concentric arrangement of closely set rings of scaling epidermis (Mn).

Tinea Tonsurans—Ringworm of the Scalp.

Mercury, the Bichloride, gr. xx to the ℥ of simple ointment, is an effective application when used early (B); must be used with caution. **Carbolic Acid**, ʒj to the ℥ of glycerin (B). **Sulphurous Acid**, the acid of the B. P. with an equal part of glycerin, is useful; must be assisted by epilation when the affection is obstinate (R): or Startin's formula [see *ante* under TINEA FAVOSA]. **Potassium Sulpho-cyanide**, ℥ss in glycerin ℥j and water ℥vij, as lotion applied on lint covered with oiled silk, after washing the patches twice daily with warm water and soap and drying (Gee). **Sodium Chloride**, in ointment, equal parts of common salt finely powdered and vaselin, thoroughly mixed, and well rubbed in night and morning after shaving the part, until the skin becomes very sore; is most efficient even in apparently intractable cases (Perkins). **Iodine**, ʒij to the ℥ of the oil of wood tar, is an efficient application, producing no pain and preventing the extension of the disease (R). **Arsenic Iodide**, is the best constitutional remedy; gr. $\frac{1}{10}$ increased to gr. $\frac{1}{4}$ for an adult, gr. $\frac{1}{20}$ to $\frac{1}{15}$ for children, with alkaline lotions locally (Wa). **Viola Tricolor**, the leaves are employed in Italy for tinea capitis (P). **Cocculus Indicus**, a decoction locally applied after washing the part well, is efficient (P). **Quinine**, dissolved in glycerin, or a mild mercurial pomade, as grease to the hair of the patient and uncontaminated members of the family, to prevent the sporules reaching unaffected parts (R). **Oils**, may be used to facilitate the removal of the scabs (R). **Cleanliness**, and free use of soap and water, is a *sine qua non*, and in some cases of tinea may be alone sufficient to produce curative results. Isolation of person, and brushes, towels, etc., necessary to prevent infection. **Fungus**—the *Trickophyton tonsurans* (A).

Tinea Versicolor.

Iodine locally, preceded by washing with soft soap and warm water (Morris). **Sulphurous Acid**, diluted to one-fourth with water, or a strong solution of Sodium Hyposulphite, as local applications (Id). **Benzol** and lavender water, equal parts of each (Id). **Chrysarobin** and Salicylic Acid, dissolved in Traumaticin or Collodion (Morrow); [see under DHOBIE ITCH for formula]. **Fungus**—the *Microsporon furfur*.

Tongue.

Potassium Chlorate, gr. v internally and ʒj–ij ad Oj aquæ locally; in ulcers of tongue (Wa); also for rawness of tongue in advanced phthisis. **Potassium Iodide**, in syphilitic ulcers of tongue (D); and in hypertrophy (A). **Potassium Bromide**, ʒj to ℥vj water as wash, may soothe morbid sensibility of the tongue (A). **Borax**, Sodii Boratis gr. xl, Glycerini ℥j, Aquæ ℥iv, as application in cracked tongue (Wa). **Iodine**, the tincture locally by a fine brush, or as a gargle with 7 or 10 parts of water and some honey, has given uniform success in malignant ulcers (Wa). **Aurum**, internally and locally, has cured hypertrophy of the tongue with induration thereof in scrofulous subjects, also strumous ulceration of the tongue. **Conium**, is thought to act specifically with benefit in ulcer of the tongue (Wa). **Cinnamon**, the oil as a powerful stimulant in paralysis of tongue (P). **Ginger**, **Cochlearia**, **Pyrethrum**, as gargles. **Cloves**, **Mezereon**, **Pepper**, as masticatories, in paralysis (P). **Frenum**, should be divided in tongue-tie; use blunt-pointed scissors, directing the points down close to the jaw, so as to avoid wounding the ranine artery (D); better to cut as little as possible, and directly backwards, as the artery of the frenum may proceed from the sublingual (Holmes). [Compare GLOSSITIS, RANULA.]

Tonsillitis.

Aconite, when high fever and elevated arterial tension, relieves greatly, gtt. ss–j of tincture every ½-hour or hour (B); every ¼-hour for 2 hours, then every hour, will almost certainly prove efficacious (R). **Belladonna**, of surprising efficacy, gtt. v of tinct. every 3 hours in ℥ss aquæ (P). **Mercury**, often speedily removes; Calomel, gr. $\frac{1}{20}$, or Hydr. cum Creta, gr. ⅕ every 2 hours; not in chronic forms (B); gr. ⅓ of Gray Powder every hour when tonsils almost meet, has marked effect; the Oleate of Mercury and Morphine in obstinate and painful tonsillitis (R). **Silver Nitrate**, locally may abort, if applied early (R); the solid stick, once thoroughly applied in the first stage, rarely fails to prevent suppuration (Howard). **Guaiac**, disagreeable, but very effective (P); ℥ss doses of tincture every 4 hours has remarkable power; should be given in emulsion with mucilage or yolk of an egg (B); makes an excellent gargle, [see page 576 for formula]: the tincture of Guaiac and glycerin, equal parts, in ʒ doses every hour or two, gives excellent results in acute tonsillitis. **Opium**, gr. v–x of Dover's powder at bedtime, is in many cases curative (Shoemaker). **Cocaine**, in 10 per cent. solution, locally, at intervals of 15 minutes, removes pain at once and promotes resolution; a very efficient application in 5 or 10 per cent. solution, but causes temporary paralysis of palatal muscles, so that liquids regurgitate through the nose (Boeckel): a strong solution painted freely over the affected tonsil in cases which commence on one side of the fauces, will cut short the attack in most cases and prevent suppuration. **Emetics**, at the very onset of the disorder, will sometimes succeed in cutting it short (Sir Thomas Watson). **Alum**, dry or in solution (R). **Potassium Iodide**, locally, gr. j–v to the ℥, is useful (B). **Potassium Chlorate**, in grain doses every half-hour, very efficient (Smith). **Capsicum**, the dilute tincture in a gargle, or in powder applied on a swab, is useful in severe tonsillitis, especially in that accompanying scarlatina (W). **Quinine**, gr. x–xv will sometimes abort (B). **Tannic Acid**, is useful (P); as gargle, [see page 795]. **Ice** and wet pack, extremely grateful (B). **Hydrogen Dioxide**, the solution as gargle, is used with great benefit. **Cold Wet Compress**, around neck, covered with oiled silk and a dry bandage, applied nightly, is very useful. **Sodium Bicarbonate**, locally by wetted finger to surface of tonsils every five minutes for ½-hour, then every hour during the same day, will prevent necessity for lancing (Lyon Médical). **Incision** of the tonsils gives immediate and marked relief in all cases especially those which are not amenable to ordinary treatment.

℞. Tinct. Aconiti, ... ʒss.
Tinct. Guaiaci,
Syr. Zingiberis, ... āā ℥ss.
Syr. Simplicis, ... ℥ij.

M. Sig.—ʒss–ij every 2 hours, according to age. In severe cases, with high fever, bounding pulse, severe headache. (*Shoemaker.*)

Tonsils, Enlarged.

Ammonium Iodide, ʒss in ℥j of glycerin, applied every night by a camel's-hair brush, very efficacious (Wa). **Barium Iodide**, in hypertrophy of the tonsils, effects a rapid diminution in their size, even when indurated for years (Hale). **Liquor Ferri Chloridi**, diluted, ʒj–ij to the ℥, painted over tonsils twice daily, is one of the most effective astringents (Mackenzie). **Aluminum Sulphate**, a saturated solution applied daily by a brush, as a mild caustic (W). **Ergot** or **Ergotin**, by injections into tonsils (Meigs). **Zinc Chloride**, as caustic, the most efficient and least annoying method; a saturated solution applied on a wire cotton-holder to each crypt and held there a few seconds; a few applications will shrink the gland in a week. **Tannin**, a strong solution touched daily to tonsils (H); a few sips of a saturated solution, ℥ss in ℥iij aquæ, slowly sipped, will stop bleeding, if profuse (A); gr. xx to ℥j aquæ, hypodermically, as in nasal polypus. **Silver Nitrate**, touched daily to tonsils, will sometimes make them shrink (H). **Catechu**, a serviceable astringent gargle; the infusion ℥vj with tincture of Kino ʒij, as gargle (Wa). **Oxgall**, locally, is praised (Wa); is of real utility (Wa). **Citric Acid**, rubbed daily to tonsils, is highly praised in enlargement thereof. **Excision** of a part of the tonsil (H): Mackenzie's double guillotine removes both tonsils at once; hemorrhage seldom happens, ice will generally check it (A). Surgical measures should receive unprejudiced consideration, as the medical treatment is tedious in the extreme.

Tonsils, Ulcerated.

Coptis, the infusion as a gargle (B). **Sulphurous Acid**, dilute, locally by spray, or a solution of Sodium Sulphite ʒj in water ℥j (B). **Potassium Iodide**, will arrest syphilitic ulcerations at once (B). **Carbolic Acid**, a 5 per cent. wash with tincture of Myrrh, a good application by sponge to throat (Wa). **Cimicifuga**, a decoction of the root as a gargle (Wa).

Torticollis.

Cimicifuga, has curative efficacy (P). **Capsicum**, a handful of the crushed pods infused for 36 hours in a pint of hot or cold water, and applied on lint covered with gutta-percha (R); gives striking results (Wa). **Opium**, as liniment with friction, or an opium plaster, is often serviceable (Wa). **Potassium Bromide**, in large doses with Arsenic, may always be tried in the spasmodic form, which is sometimes one of the most obstinate complaints (Whitla). **Gelsemium**, some cases have been reported as cured by its hypodermic administration after tenotomy or myotomy had failed (Id); very large doses, ♏iij of Wyeth's fluid extract thrice daily, increased until eight times this amount is taken, so as to produce very pronounced physiological symptoms, in spasmodic torticollis (Weir Mitchell). **Surgical Treatment**, by stretching or resection of a portion of the spinal accessory nerve, has succeeded sometimes in spasmodic torticollis, but it has also failed, and being so unsatisfactory should not be tried except as a last resort (Whitla). **Electricity**, galvanization of the affected muscles and faradization of the opposed ones, quickly relieves (B); has given excellent results in spasmodic torticollis, and if resorted to early may succeed, but must be persisted in for some time (Whitla).

Toxemia.

Saline Injections, beneath the skin and into the veins, successfully used in various forms of toxemia, as diabetic coma and the anemia and collapse following intestinal hemorrhage in cases of typhoid fever. The apparatus employed is uncomplicated and the technic simple. Care must be taken to avoid air-embolism and the introduction of foreign bodies. If the patient is robust and his condition sthenic, with venous infusion on one side may be conjoined venesection upon the other. The object is to hasten the dilution and elimination of the poison, both directly and through the skin and the kidneys particularly. The results are good in a certain proportion of cases and sometimes extraordinary, while the procedure is practically harmless (Hare). Deci-normal salt solution injected into a vein and filling the rectum with a saturated solution of Magnesium Sulphate (McKeown). [Compare SEPTICEMIA, SHOCK, UREMIA.]

Tremor.

Hyoscyamus, the tincture in full doses will palliate mercurial tremor; or Hyoscyamine, gr. $\frac{1}{32}$ gradually increased to $\frac{1}{16}$ (B). **Hyoscine**, is a useful drug in diseases having tremor as a marked symptom, as disseminated sclerosis, delirium tremens, etc., and is usually quite safe (Weatherly). **Coniine**, will control excessive tremor in many instances. **Gelsemium**, in full doses may palliate excessive tremor; a combination of Hyoscyamus, Conium and Gelsemium, the first to keep the brain quiet, the latter to quiet the nervous irritation at both the central and peripheral extremities (Lavers). **Cocaine**, influences alcoholic and senile tremor more favorably than any other remedy; large doses and frequent administration are unnecessary (B). **Veratrine**, has been used successfully in alcoholic tremor and that of disseminated sclerosis, also in the trembling weakness of typhoid fever (Ferris). **Calcium Salts**, were given by me in one case of tremor at the beginning of general paralysis, resulting in its cessation for several months (Br). **Arsenic**, ♏ij–iij of Fowler's solution, diluted with two parts of water and given hypodermically, was successful in several cases (Eulenberg). **Phosphorus**, in alcoholic and mercurial tremor (De Mussy). **Silver Nitrate**, gr. ⅛–iij daily, used in six cases of mercurial palsy with fairly rapid recovery (Sementini). ***Zinc* Phosphide**, is effective in the tremor of mercurial and arsenical poisoning (De Mussy); not so in the tremor of sclerosis (P). [Compare Chorea, Delirium tremens, Paralysis agitans; also *Brunton's Pharmacology*, 3rd edition, page 133, for the Pathology of Tremor.]

Trichiniasis.

Benzol, in doses of ♏x, every hour or two, up to ʒjss daily, followed by a brisk laxative, has been very successful in 27 cases, treated simultaneously (Putter). **Purgatives**, as Rhubarb and Senna, or an occasional dose of Calomel, to thoroughly evacuate the gastro-intestinal canal. **Glycerin**, in large doses, to destroy the worm by its hygroscopic qualities, has been recommended. The indications, in the stage of invasion, are to relieve the pains, to secure sleep, to combat the fever, and to support the patient's strength; there are no medicines which have any influence upon the embryos in their migration through the muscles (O).

Trismus.

Aconite (A), **Atropine** (R), hypodermically. **Cannabis Indica**, has been used successfully in trismus neonatorum (B). **Opium**, ♏ ⅛ doses of Laudanum, with Castor Oil and warm bath, in trismus infantum. **Ether, Chloral, Gelsemium, Physostigma** (B). Treatment of any kind is seldom effectual (D); is never effective (El). Trismus neonatorum, lock-jaw of the new-born infant, may be due to many causes; one of which is bathing in very hot water. A certain midwife, whose hands could not distinguish the differences in temperature of the bath, sent me over 100 cases (Weber).

Tuberculosis, Acute.

Quinine, to subdue the fever, also **Salicylic Acid** for the same purpose, with repeated blistering over different parts of the chest and many dry cuppings of the lower limbs and the trunk morning and evening; this, with wine and alcohol, broths, jellies, milk and peptonized foods, is my plan of treatment for acute miliary tuberculosis, by which one case was absolutely cured (Jaccoud). **Arsenic**, appears to reduce the temperature gradually and is useful in many ways (R). **Cold**, to the surface of the abdomen, with ice sucked freely, the body sponged with iced vinegar and water, food and drinks to be iced, and even iced enemata sometimes; with Quinine, gr. x–xxx once in 48 hours, or the pill of Quinine gr. j, Digitalis gr. ss, and Opium gr. ¼, every 4 hours, fluid food every hour or half hour day and night, in acute miliary tuberculosis, may bring about a cure if energetically followed from the beginning (McCall Anderson). [Compare Phthisis.]

Tuberculous Affections.

Arsenic, children affected with tuberculosis involving the lungs, intestines and peritoneum, have steadily and slowly improved and finally recovered under Arsenic treatment (R). **Salicylic Acid**, Unna's strongest plaster, applied repeatedly for several days, to remove the horny covering in tuberculosis verrucosa cutis; this will remove much, and the rest is destroyed by the fuming Acid Mercuric Nitrate, applied to a small portion of the growth at a time, as it is painful (Crocker). **Camphorated Naphtol**, hypodermically in tuberculosis adenitis, tuberculosis of the testis and of the bladder, etc. [see page 388]. **Potassium Cantharidinate**, gr. $\frac{1}{650}$ to gr. $\frac{1}{320}$ hypodermically, produces an exudation of serum throughout the body, and may cause a concentration at an affected spot of efficacious substances which would not ordinarily find their way there, but it should not be employed when kidney disease exists (Liebrich). **Hydrargyrum Thymol aceticum**, in solution injected into the glutei muscles every eight days, followed after a few injections by Potassium Iodide, gr. iij thrice daily by the mouth, as a cure for tuberculosis (Tranjen, Ewald). **Zinc Chloride**, in dilute solution, deeply injected into the tissues surrounding tubercular deposits, in order to induce a condition of sclerosis fatal to the growth or existence of the bacilli; in tuberculosis of the epididymis and in spina ventosa a 1 in 20 solution; for tuberculous disease of the joints, ribs and glands a 1 in 10 solution, of which 20 drops to be injected in a number of places around the periphery of the diseased part (Lannelongue). **Iodoform**, a 10 per cent. emulsion filled into the cavity after free opening and scraping, the cavity being then sewn up, gives excellent results in tuberculous abscesses (Billroth); a sterilized 10 per cent. emulsion made with glycerin or olive oil, injected every 14 days or oftener into tuberculous joints and abscesses after thorough aspiration, also in tubercular empyema (Bruns); this may be well employed for all forms of local tuberculosis of soft parts, as the glands, testes and lungs (Trendelenburg). **Cod-liver Oil**, is the remedy from which we can expect the most good in the tuberculous diathesis (Wa). **Antitoxin**, Paquin's serum has given good results in knee-joint tuberculosis (Cale); also in other forms [see page 181]. **Antiphthisin**, is doing good service in cases of pure tuberculosis [see page 514]. **Tuberculin**, as a diagnostic agent for latent tuberculosis [see page 513]. [Compare LARYNGITIS TUBERCULAR, LUPUS, MENINGITIS TUBERCULAR, PERITONITIS TUBERCULAR, PHTHISIS, SCROFULOSIS, TABES MESENTERICA.]

Tumors.

Mercuric Bromide, in ½ grain doses, has benefited abdominal tumors (Wa). **Chloroform**, to aid in diagnosis of abdominal tumors when deep-seated, and when walls of the belly are hard and rigid; also in phantom tumors (R). **Pepsin**, hypodermically, to dissolve them. **Hyoscyamus**, the leaves as cataplasm or fomentations to painful tumors, afford great relief (Wa). **Iron**, the Liquor Ferri Chloridi is found to be valuable as a curative application to fungous or hemorrhoidal tumors (Wa). **Galbanum**, as plaster to indolent, non-malignant tumors, to diminish or cause their absorption (Wa). **Electrolysis**, is employed with more or less benefit in sebaceous tumors, lipoma, bronchocele, enlarged glands, etc. (Wa): Apostoli's method for the dispersion of fibroid tumors; it will dissipate pain, improve nutrition, and diminish their size without danger to life (Bigelow); the treatment of fibroid tumors by the galvanic current has of late been universally recognized by the profession (Massey); solid tumors, as goitre, enl[illegible] glands and similar growths have been repeatedly cured by elec[illegible] [illegible]mpare CANCER, CYSTS, GLANDULAR ENLARGEMENT, [illegible]E TUMORS, WEN.]

Tympanites.

Turpentine, often greatly benefits (P, Wa); ʒj every 6 hours in tympanites of typhoid, with prostration but without diarrhea (R). **Asafœtida**, in hysterical tympanites, internally or as enema, beneficial (P); also in that of fever (Wa). **Capsicum**, gr. ss–ij, every 4 hours (P). **Cocculus Indicus**, a few doses of the tincture will often succeed in the tympanites of peritonitis and enteric fever (P). **Ginger**, with drastic purgatives (P). **Posture**, relieves many bad cases promptly; inversion or partial inversion of the patient, as in the knee-chest position, for 10 or 15 minutes, to cause the gravitation of the bowels upwards, thus straightening out the rectum; or if this is not practicable, place the patient on one side and elevate the foot of the bed two or three feet (Sweetnam). **Surgical Measures**, by celiotomy and incision of the gut, should be done promptly, when cathartics, posture, enemata and the use of the rectal tube have failed to give relief (Porter). **Puncture** or **Aspiration** only in extreme cases and as a last resort, and then only in such cases which present no other cause for celiotomy than the tympany itself, as typhoid fever without perforation, pneumonia, etc. (Id). [Compare PERITONITIS, TYPHOID FEVER.]

Typhlitis.

Opium, of undoubted curative power (B). **Purgatives**, are inadmissible; Epsom salt may be used, but no drastics (B). **Leeches**, should never be omitted when tenderness and fever begin (B). **Ice-bag**, over the swelling (B); has conquered many cases which the surgeons would operate on for appendicitis.

Typhoid Fever.

Guaiacol Carbonate, in two daily doses of 25 to 30 grains, is highly efficient, sixty cases treated thereby with no deaths; is non-poisonous, but does not affect the temperature, hence antipyretics may be required (Hoelscher); is the principal ingredient in the *Woodbridge abortive treatment* [see formulæ on page 863]; aims at aborting the disease by intestinal antisepsis and elimination. **Guaiacol**, 10 to 15 drops of pure Guaiacol painted over the skin of parts where it is readily absorbed is very efficient in reducing temperature when exceeding 102° (Montagnon). **Carbolic Acid**, ʒj with tincture of Iodine ʒij, of which mixture 1 to 3 drops every two or three hours, is a very good plan of treatment (Da C); all his cases during an entire year were treated with a mixture of Carbolic Acid and Chloroform, without the loss of a single case, by Dr. Quill of the Indian army [see page 90]. **Chloroform**, the spirit in mixture of Carbolic Acid, as above; a ½ per cent. solution of Chloroform will kill the bacillus of enteric fever (Werner). **Copper Arsenite**, in divided daily doses of gr. $\frac{1}{100}$, commenced early and continuously used, will maintain a moderately low temperature, a good pulse rate, comparative freedom from great abdominal pain and tympanites, and will lessen materially the number of stools, while it greatly improves their character and consistence (Aulde); used in 90 cases with but one death; leaves an excellent condition of the alimentary tract after the fever is over (Thomas). **Salol** is of great value as an intestinal disinfectant, promoting healing and preventing reinfection; given in 5 to 10 grain doses, according to age, every 4 hours until the urine is tinged, then reducing the amount and frequency, but maintaining a faint coloration of the urine, has for ten years afforded me the most gratifying results (Bramwell): it should not be given in the compressed tablet form for many reasons. **Salophen** has proved equally efficient.

Nitro-hydrochloric Acid, is to be preferred over all other plans of treatment, 20-drop doses in simple elixir, also Sulphuric acid for intestinal hemorrhage

(Da C). **Mineral Acids**, are very useful generally, especially HCl (Wa). **Thymol** may also be employed, in doses of gr. ss–ij in solution (Da C). **Sulphurous Acid**, is highly praised by Dewar, and has real antidotal power; ♏ijss–xx every 4 hours according to age, continued for a weak or ten days, until the patient's complaints show him to be saturated; if diarrhea be present add Sulphuric Acid and Opium (Wilks). [Formulæ on next page.] **Cinnamon**, the Oil is efficiently used to abort the disease [see page 277]. **Potassium Bromide**, is as much a specific for typhoid fever as Quinine Sulphate is for ague, aborting the fever in 8 or 10 days (Hawkins). **Arnica** is highly extolled; its "picture" shows definite powers in this disease (P); small doses in asthenic conditions (B); when vital powers are greatly depressed (Wa). **Baptisia** is very useful in the early stage (W). **Turpentine**, invaluable when hemorrhage and extreme tympanites (P, R); ♏xxx–lx in Starch mucilage and ♏x of Tinct. Opii (P); ♏v–x frequently for hemorrhage or ♏x every 2 hours in advanced stage, with dry tongue (R); when coma, stupor, it often arouses the vital powers (Wa); ♏vij with gr. $\frac{1}{48}$ of Morphine; of especial value when marked fever and congested lungs, as well as for the tympany (Da C). **Chloral**, is the best drug for nervous symptoms, but must not be used when the heart is weak (Da C). **Opium**, small doses at night, for insomnia with delirium; also as injection for the diarrhea (R); in one case when vital powers seemed hopelessly depressed, gr. ½ caused improvement (Wa); for spreading tenderness (peritonitis), give 10-minim doses of the deodorized tincture, also gr. j in suppository every four hours (Da C). **Belladonna**, when contracted pupils, low, muttering delirium (B); is thought to counteract the poison of typhoid (Wa). **Mercury**, Corrosive Sublimate gr. $\frac{1}{100}$ every 2 or 3 hours for the diarrhea; Calomel in small doses at onset (R), gr. x in one dose the first day, gr. iij per diem for 3 or 4 days, the German "specific treatment" (B). **Bismuth**, gr. x–xxv of the Subnitrate with gr. ½–j of Opium every 3 hours for the severe diarrhea (Da C). **Ergot**, for intestinal hemorrhage, hypodermically if the symptoms are urgent (R); Ergotin, gr. ij–vj hypodermically, or ʒj of the fluid extract of Ergot, for intestinal hemorrhage (Da C). **Tartar Emetic**, with Opium, when wakefulness and delirium; minute doses gr. $\frac{1}{16}$ frequently, are of great service (B); Antimony cuts the disease short with such certainty that it is almost doubtful whether the lesion of typhoid is specific or is not rather incidental or adventitious (Lawrie); should be given with cardiac tonics. **Digitalis**, of value in many cases as a sustainer of heart power, but may be dangerous in the later stages (Anstie, Murrell); used by the Germans when there is no cardiac weakness; gr. x–xx as antipyretic, over a period of 36 hours (P). **Quinine**, may have efficacy in typho-malarial fever, is less effective as the typhoid element predominates, useless in purely continued fevers (B); is justly abandoned, but may be used to maintain the circulation, in tonic doses, gr. vj–x in the 24 hours (Da C). **Medicines** should not be given in tablet or pill form, which are liable to cause irritation of the intestinal lesions.

Antipyrin, Phenacetin, Acetanilid, are extensively used as antipyretics; for the dangers depending on the extensive employment of the latter drug see page 79. **Phenocoll Hydrochloride** as an antipyretic, is used with marked success. **Veratrum Viride**, to reduce temperature (R); for delirium ferox (B); strongly recommended (Wa); its efficacy difficult to believe (S). **Serpentaria**, useful when much depression exists, cautiously if intestines at all irritable (B). **Hydrastine**, when copious sweats (P). **Lead Acetate**, with Opium, for the purging (R); also **Alum** (R). **Lime-water**, as an astringent and antacid, is efficient. **Sodium Chloride**, should not be withdrawn from the food (Wa). **Aromatic Spirit of Ammonia**, for great accumulation of mucus in the throat (Da C). **Copper Sulphate**, gr. $\frac{1}{12}$, with Opium, gr. ⅓, for the diarrhea (Da C). **Strychnine**, is the remedy for the functional palsies (Da C). **Purgatives**, only mildest, and they with the greatest caution (Wa). **Medicine**, will a case of true typhoid, its natural duration is from 28 to 30 days ser). **Typhoid Antitoxin**, has been used in a few cases, apparently [see page 184]. **Cold Baths**, when the temperature rises above 102°, a most important agent (B); in mild cases, cold wet compresses or wet sheets, or washing with cold water; in severe cases, affusion, shower, or general cold bath, 50° to 55° F., or better 95° cooled gradually to 60° (R); this, the Brand (more justly Currie's) method, increases the flow of urine and its toxicity, restoring the latter to normal and sometimes to double the normal, thereby clearing the system of a large quantity of toxins (Ausset). **Stimulants,** freely, with Quinine, for pyemic cases, showing joint complications [see under SYNOVITIS]. **Aliment,** by Milk alone, or alcohol with milk, eggs, broth (B); Coffee, a better stimulant than alcohol (P); Alcohol is needed to sustain the heart's action (Da C); Milk must be used with great caution; if the curd be undigested great evils arise; give essence of meat alone (Sir Wm. Jenner); avoid the extremes; an absolute milk diet required if intestinal symptoms are grave; no solid food until health is restored fully; a scalded-milk diet exclusively may be depended on. **Adjuvants,** water, especially the abdominal compress, cleanliness, ventilation, absolute rest and quiet. **Discharges** should be received in vessels containing Carbolic Acid or a solution of Corrosive Sublimate, and buried instantly. [Compare HEMORRHAGE INTESTINAL, RECTAL ULCERATION, TYMPANITES.]

℞. Resin. Podophylli, ... gr. $\frac{1}{960}$.
Hydrarg. Chloridi Mitis,
Guaiacoli Carbonatis,
Mentholi, ... āā gr. $\frac{1}{16}$.
Eucalyptoli, . . . q. s.

Ft. tabella no. j. Sig.—One or more of these tablets every ¼ hour during the first 3 days, to secure 5 or 6 free evacuations daily (*Woodbridge No. 1.*)

℞. Resin. Podophylli, ... gr. $\frac{1}{960}$.
Hydrarg. Chloridi Mitis,
Mentholi,
Thymoli . . . . āā gr. $\frac{1}{15}$.
Guaiacoli Carbonat., . . . gr. ¼.
Eucalyptoli, ... q. s.

Ft. tabella no. j. Sig.—One tablet every hour or two, after third or fourth day, reduced so as to gradually lessen frequency of evacuations, until the temperature returns to normal. (*Woodbridge No. 2.*)

℞. Mentholi, ... gr. ss.
Thymoli, ... gr. j.
Eucalyptoli, ... ♏v.
Guaiacoli Carbonat., . . . gr. iij.

Ft. capsula no. j. Sig.—One capsule every 3 or 4 hours, alternating with the tablets, after the fourth or fifth day of treatment. All the medicines to be washed down with large draughts of distilled or sterilized water. (*Woodbridge No. 3.*)

℞. Tinct. Iodi,
Acidi Carbolici, ... āā p. æq.

M. Sig.—gtt. j–ij every 4 or 6 hours. In typho-malarial fever, and in typhoid.

℞. Acidi Sulphurosi,
Acidi Sulphurici Dil., . . āā ʒ ij.
Tinct. Opii Deodor., . . . ♏xx.
Syr. Aurantii, ... ℥ iij.
Aquæ, ... q. s. *ad* ℥ vj.

M. Sig.—One-sixth to be taken every 4 hours. (*Wilks.*)

℞. Acidi Sulphurosi, ... ♏xv.
Syr. Aurantii, ... ʒ iij.
Aquæ, ... q. s. *ad* ℥ j.

M. Sig.—For infants, one-sixth every four hours. (*Wilks.*)

℞. Ant. et Potassii Tartrat., . gr. j–ij.
Morphinæ Sulphat., ... gr. ss.
Aquæ Laurocerasi, ... ℥ j.

M. Sig.—A teasp. every two, three or four hours.

℞. Quininæ Sulphatis, ... gr. x.
Acidi Hydrochlor. Dil.,
Vel Ac. Sulphurici Dil., . . ℥ ss.
Syr. Aurantii, ... ℥ j.
Aquæ Cari, ... q. s. *ad* ℥ vj.

M. Sig.—A tablesp. in an equal quantity of water, every three or four hours. (*Murchison.*)

Typhus Fever.

Phenacetin, is extensively used for the pyrexia. **Baptisia,** is said to have proved very useful (W). **Belladonna,** to cleanse and moisten the tongue; controls the delirium, slows and strengthens the pulse, reduces the temperature, shortens course of disease (R, P); in the early stages, relieves severity of symptoms (P); give when contracted pupils (Wa). **Arnica,** very highly extolled (P, Wa). **Hyoscyamus**, for mild brain symptoms (P). **Opium**, fulfils many important indications; never give when pupils are contracted (Wa). **Mineral Acids**, their use recommended in all countries (Wa). **Tartar Emetic**, with Opium in the delirium with insomnia (R). [See under TYPHOID.] **Chloral**, to produce sleep and allay violent delirium (R, Wa); its use has often been followed by amelioration of the symptoms (Wa). **Antipyrin or Quinine**, as antipyretics, it being more necessary than in typhoid to keep the temperature within safe limits (B). **Podophyllin**, gr. $\frac{1}{6}$–$\frac{1}{4}$ as mild laxative at onset, when constipation, congestive headache, biliary derangement (P). **Digitalis**, in large doses, a favorite remedy in Germany (P). **Rhatany**, as tonic, in advanced stages (P). **Serpentaria**, in low stage, delirium, watchfulness, tongue dry and brown, or black; combine with Ammonium Sesquicarbonate (P); is given occasionally to excite diaphoresis and support the vital powers (Wa). **Camphor**, a remedy of considerable value, but contraindicated when flesh-red tongue, tender abdomen, diarrhea (Wa). **Purgatives** [see under TYPHOID FEVER]. **Coffee**, better than alcohol for the adynamia (P). **Stimulants**, are not needed under the use of mineral acids and a supporting diet in many cases (Wa); are needed sooner than in typhoid, as the adynamia is more profound and appears sooner (B). **Diet**, nutritious persistently, beef-tea, egg-nog, nutrient enemata. **Isolation**, imperative, as the disease is eminently contagious (B). [Compare DELIRIUM, TYPHOID FEVER.]

Ulcers and Sores.

Arsenic, improves rodent ulcer (B). **Belladonna**, has a remarkable influence over various ulcerative processes (P). **Chloral**, as lotion for sluggish sores, 5 to 20 grains to the ℥ of water (Keyes); is highly efficient in ulcerated sore throat or ulceration from any cause (Brodnax). **Mercury**, Calomel finely levigated and dusted on, is highly efficient in ulcer of the conjunctiva; Calomel Ointment or Black Wash in scrofulous or tuberculous lupus, and in open scrofulous sores (R); Corrosive Sublimate, in 1 per cent. solution, as application to syphilitic ulcers (Fox); the Ung. Hydrarg. Nitratis, for serpiginous ulcerations diluted one-half, or the Iodide, gr. xx–xl to the ℥ of vaselin, in syphilitic ulcerations (Keyes). **Lime**, as the Carbonate or Lime-water to check discharge; the Sulphide when thin ichorous discharge; the Phosphate has influence on scrofulous sores (R). **Phytolacca**, as a local application (B). **Hamamelis**, employed with satisfaction in varicose ulcers (Pf). **Opium or Morphine**, with glycerin, as an application to relieve pain (R); gr. j–ij, daily, also locally, has a decidedly curative value in phagedenic and indolent ulcers; not so useful in so-called irritable ulcers (Pf, P). **Ichthyol**, pure as oint. or with Lanolin, has done excellent service in ulcers of the leg. **Thiol**, the dry form, as dusting powder, has been of great benefit. **Piperazin**, in 1 per cent. solution, locally to gouty sores, relieves the pain and reduces the inflammation. **Resorcin**, in strong or supersaturated solution, locally applied to tuberculous and other ulcerations of the larynx, is efficient and painless (Tymowski). **Tannin**, or Glycerite of Tannin, to coat over wounds or discharging sores (R). **Potassium Chlorate**, in solution as a wash to clean and stimulate foul ulcers (R); in impalpable powder, a better application than Iodoform (B). **Cinchona**, powdered Bark dusted over foul, indolent, sloughing and gangrenous ulcers, promotes healing (R). **Conium**, locally, by means of a poultice, will ease pain and improve the sore (R). **Chlorine**, in solution as a wash for sloughing and indolent sores (R); the gas as a local stimulant to promote healing in old ulcers, is highly efficient; [for the method of application see page 267]. **Iodide of Starch**, cold, as a poultice (R). **Acetanilid**, in fine powder, dusted on, is an excellent application to ulcers and
es. mucous patches and ulcers of the rectum [see page 79]. **Lead**, the solu-
of lead as lotions to unhealthy over-secreting sores (R). **Pyrogallic**
excellent application to venereal ulcers (Vidal). **Nitric Acid**, as
plied with a glass rod, Oil to protect the surrounding tissues.

arrest by alkaline wash; ℥j to Oj is a good acid lotion for washing (B); the lotion for indolent and painful ulcers (R). **Hydrastis**, internally and externally, employed with excellent results in rodent ulcer, and ulcers of legs, rectum, and uterus (R). **Sanguinaria**, locally, to repress fungous granulations of indolent ulcers, 1 part to 80 of Glycerin (P). **Carbolic Acid**, and **Salicylic**, locally (B); the Glycerite of Carbolic Acid a good application to fetid sores (R); Carbolic Acid, pure, freely applied under chloroform anesthesia, as a powerful and penetrating caustic to destroy the diseased surface, in tropical sloughing phagedena (Mn). **Balsams of Peru** and **Tolu**, excellent (P). **Camphor**, dusted over indolent sores (R). **Charcoal**, locally to sloughing sores (R). **Alcohol**, locally to cover sores with thin protecting layer of coagulated albumin (R). **Alum**, dry or in solution, applied to relaxed and abundantly-secreting sores (R). **Turpentine**, internally for ulceration of bowels (P). **Collodion**, as protective covering (P). **Capsicum**, a weak solution useful as a stimulant in scrofulous or fistulous sores (P). **Savine**, as acrid (not chemical) caustic (P). **Potassa Fusa**, or the milder Vienna paste, as escharotic; to arrest its action use a dilute acid (B). **Zinc Chloride**, the most efficient escharotic consistent with safety (B). **Zinc Sulphate**, dried, dusted over sores (R). **Iodoform**, dusted over surface (B); prevents granulation in all ulcers, and does no good except to relieve pain (Gross). **Aristol**, is highly praised; an excellent substitute for Iodoform, being quite as efficient, and odorless; has given excellent results in treatment of indolent soft ulcers, syphilitic ulcerative processes, etc. **Silver Nitrate**, as caustic, quickly rubbed over surface (B); applied to unhealthy ulcers, also ulcers of the mouth (R). **Copper Sulphate**, to indolent ulcers: touch with a crystal, or frequently apply a solution, gr. ij–x to the ℥ (R). **Coptis**, the infusion has high reputation (B). **Chimaphila, Copaiba, Catechu, Myrrh, Rhatany, Rhubarb, Storax, Benzoin, Tar-water**, locally, are useful (P). **Oxygen**, to atonic, painful ulcers (R); locally applied to ulcers [see page 410] is highly efficient (Stoker). **Nuclein**, locally applied, cured an ulcer of 20 years' standing in 4 months (Vaughn). **Aurum**, locally and internally, is highly recommended in scrofulous ulceration. **Galvanic Couplet** [see under BEDSORES]. **Yeast**, as a poultice (R); its action probably due to the Nuclein contained in it. **Section** of exposed nerve-filament, in irritable ulcer, by bistoury passed beneath the sore (Hilton). **Cod-liver Oil**, especially for ulcerations of the glands, or indolent ulcers with excoriated edges, lupus, etc. **Water**, is sufficient as dressing in the majority of cases. **Hot Water**, applied by the continuous immersion therein of the affected limb, is perhaps the most efficient treatment of indolent ulcers of the leg or foot, resisting other applications; proved very successful in my Philippine experience for tropical ulcer and gangrenous sores of the leg, fissures and sores of the feet, and similar affections. **Rest** and support of great value; cleanliness, bandaging and recumbent position in ulcer of legs, facilitate recovery; also daily washing to restore the lost vitality of parts; elastic stockings, and the Esmarch bandage in chronic cases. [Compare CHANCRE, CHANCROID, BEDSORES, THROAT; GASTRIC, INTESTINAL and UTERINE ULCERATION; SYPHILIS.]

℞. Iodoformi, ... ʒij.
Mucil. Acaciæ, ... ♏xv.
Ol. Menthæ Pip., ... ♏ij.
Glycerini, ... ♏xx.
M. Sig.—For unhealthy ulcers.
(*Bronson.*)

℞. Emplas. Plumbi, ... ℥ij.
Ung. Hydrargyri, ... ℥ss.
Olei Cadini, ... ʒij.
M. Sig.—Spread on linen, and apply to inflamed patches on palms from syphilis.
(*Bumstead and Taylor.*)

℞. Hydrarg. Chlor. Cor., . . . gr. xv.
Acidi Carbolici, ... ♏xx.
Aquæ, ... q. s. *ad* ℥iv.
M. Sig.—For syphilitic ulcers, pack on cotton, and renew daily. (*Fox.*)

℞. Ung. Petrolei, ... ℥ij.
Ung. Hydrargyri, ... ʒiv.
Olei Cadini, ... ʒij.
M. Sig.—Apply after removing scales to chronic palmar and plantar lesions.
(*Bumstead and Taylor.*)

Uremia.

Pilocarpine, as an active diaphoretic, on the first appearance of uremic symptoms, as headache, drowsiness, convulsions; also free purgation by salines or Elaterium (Y); a weak or fatty heart is a positive contraindication for this drug (B); it must not be used if edema of the lungs exists, as further edema and death will result (Whitla). **Digitalis**, the infusion internally, or a poultice of the leaves to the back and abdomen, to procure free action of the kidneys (B). **Morphine**, hypodermically, is most efficient (Loomis, Scanzoni); in acute not in chronic uremia (Pf); is of remarkable value in uremic convulsions (B). **Oxygen**, by inhalation, 10 litres thrice daily, is used with success (Jaccoud); is as useful in practice as it is rational in theory (Carter); used with remarkable success in a very bad case of uremic coma (Macalister). **Sodium Benzoate**, 15 grains 4 times daily, has been found very serviceable in threatening uremia (Whitla). **Sodium Bromide** with **Chloral**, in full doses, by the bowel, for uremic convulsions (Id). **Potassium Salts** given in Bright's Disease increase the danger of uremia, hence Sodium salts are preferred (Id). **Naphtalin**, also Iodoform and Charcoal, as intestinal disinfectants, as much of the toxic material in the blood has been reabsorbed from the bowel (Bouchard). **Amyl Nitrite** or **Nitroglycerin**, and brisk purgation, to relieve the dyspnea. **Ether**, in doses of ʒij by the mouth or ʒss hypodermically deep into the muscles (painful), for uremic dyspnea; must be pushed to ℥ij or iij in 24 hours before good results can be expected (Gallois); being rapidly eliminated it can be given in fairly large doses without causing intoxication. **Colchicum**, is an excellent derivative in these cases and acts best when combined with other purgatives (B). **Elaterium**, gr. $\frac{1}{16}$ to $\frac{1}{4}$, to procure free watery evacuations—cautiously! (B); the compound powder of Elaterin, gr. $\frac{1}{2}$ to iij, may be thrown on the tongue and washed down with a teaspoonful or two of water (Y). **Saline** or **Hydragogue Cathartics**, are of great importance to secure elimination by the intestinal canal and to relieve the blood-pressure (B); purgation by salines on the first appearance of uremic symptoms (Y). **Transfusion**, in uremic convulsions (B). **Hot Saline Injections**, into the cellular tissue [see under SHOCK for formula], gave excellent results in a case of chronic nephritis with uremia (Hare); used in 2 cases with good recoveries, the patients having been bled before administering the injections (Richardière); is worthy of a wide trial and seems to offer a chance of recovery in many cases which otherwise would prove fatal. **Hot Pack** or vapor-bath, to induce powerful diaphoresis (B); the hot wet-pack or hot air bath, may be given daily or oftener when uremia is threatening. **Milk** is the only admissible food. **Venesection**, 10 to 20 ounces of blood from the arm gives striking relief in acute forms of uremia in the robust (Y); leeches to the temples for the headache (Id). [Compare COMA, CONVULSIONS, BRIGHT'S DISEASE, DYSPNEA, SCARLET FEVER, and the Lists of Diaphoretics and Diuretics on pages 45 and 47.]

Urethral Stricture.

Aconite, is of great service in spasmodic stricture (P). **Cocaine**, locally, by catheter (Smith). **Buchu**, in irritable urethra, spasmodic stricture, and gleet (P). **Opium**, in full dose or an opiate suppository, with fomentations and a warm bath, will often suffice in spasmodic stricture (Cl). **Catheterization**, under an anesthetic in spasmodic stricture if other measures fail to relieve; also for gradual dilatation in organic stricture, the safest and most generally applicable treatment (Cl). **Oil**, injected before dilatation (Wa). **Thorough Division**, by a dilating urethrotome, the best operation for a radical cure; 600 cases thus treated without a death or permanent disability (Otis). **Electricity**, a weak galvanic current, with negative pole to the stricture, will destroy it in 2 or 3 sittings by electrolysis, and if carefully done, is the most efficient and least painful method of treatment for radical cure.

Urethritis.

Aconite, is used to advantage in urethral fever; also for prevention of chill after passage of sound (Pf, W). **Strophanthus**, efficient in preventing rigors after instrumentation on the urethra, the tincture in doses of 5 minims (Fenwick). **Silver Nitrate**, locally, very efficient in chronic urethritis in females (W). **Tannin**, on bougies, once a week for 15 minutes, most efficient for urethritis in the female (Wa). **Zinc Sulphate**, cast in sticks, for introduction into the urethra (Wa). **Myrtol**, internally, in chronic inflammation of the bladder and urethra (Br). **Potassium Bicarbonate**, with Potassium Acetate, āā gr. x in a large cup of flaxseed tea or a glass of Vichy water, every 4 to 6 hours; with absolute rest in bed, a calomel purge, and urination under hot water, sufficient for most cases of urethritis, which may arise from lithiasis, leucorrhea in females, etc.; many cases of so-called aborted gonorrhea were really simple urethritis (Otis). [Compare GONORRHEA.]

Urinary Disorders.

Aconite, of great service in sub-inflammatory retention from chill (P). **Turpentine**, in hematuria and chronic catarrh of the bladder, incontinence from atony, etc. (B). **Strychnine**, sometimes employed with marked benefit in retention or incontinence of the old (P). **Cantharis**, frequent or involuntary micturition, especially when coughing, in women from weakness of sphincter; one or two drop doses (R). **Cannabis Indica**, in retention from spinal diseases (R); **Diuretin**, a remarkably efficient diuretic in cardiac and renal dropsy, 15 grains several times daily will increase the urine three and fourfold. **Digitalis**, holds high rank as a diuretic, ℥j or ij of the infusion night and morning, or oftener if necessary; in sudden depression from cold or damp, or after scarlatina if danger threatens (P). **Benzoic Acid**, or Sodium Benzoate, in 10 to 15-grain doses, to render alkaline urine acid, and check the formation of phosphates (B); this acid and its salts are among the very few agents by which morbid alkalinity of the urine can be neutralized. **Salol**, is quicker in this respect than the benzoates [see page 64]. **Salicylic Acid**, to acidify an alkaline urine. **Potassium Bitartrate**, in full doses, will acidify an alkaline urine. **Urotropin**, in ammoniacal fermentation of the urine, is very efficient; renders the urine acid and is a valuable urinary antiseptic, useful also in phosphaturia. **Nitrohydrochloric Acid**, dilute, gtt. x–xv thrice daily in water, for phosphatic deposits (Mears). **Ammonium Carbonate**, in 6-grain doses, 3 or 4 times a day, to render acid urine alkaline. **Triticum**, in pint doses daily of its infusion or decoction, for strangury, cystitis, and many other complaints connected with the urinary apparatus. **Alkalies**, to neutralize acid urine, and control chronic cystitis; the Liquor Potassæ preferable to the bicarbonates, and citrates, which have diuretic action and increase frequency of micturition; Liquor Potassæ mixed with the tincture of Hyoscyamus or Belladonna, may undergo chemical changes, but the combination materially controls painful and frequent micturition in bladder troubles (Thompson). **Buchu**, renders more help than any drug known in incontinence or retention from catarrh of bladder implicating the ureters and even the kidneys (P). **Water**, copious injections are beneficial in some cases of suppression (R). **Diet**, a vegetable diet has a powerful influence to alkalinize an acid urine; also fruit, milk and fish [see page 64]. Compare the Lists of Diuretics and other agents acting upon the urine, on pages 46 and 64; also the articles entitled BLADDER IRRITABLE, BLADDER PARALYSIS OF, CHYLURIA, CYSTITIS, DIABETES INSIPIDUS, DYSURIA, DROPSY, ENURESIS, HEMATURIA, LITHIASIS, NEPHRITIS, OXALURIA, UREMIA, URETHRAL STRICTURE.

℞. Pulv. Scillæ,
Pulv. Digitalis,
Hydrarg. Chlor. Mitis, āā gr. xij.
M. ft. pil. no. xij. Sig.—One pill as a diuretic twice daily. (*Sir A. Clark.*)

℞. Potassii Citratis, ... ℥j.
Sodii Bicarbonat., . . . ʒv.
Syr. Limonis, ... ℥j.
Aquæ, ... q. s. *ad* ℥iv.
M. Sig.—A teasp. every 2 hours, to render the urine alkaline. (*Roberts.*)

℞. Tinct. Digitalis, ... ʒss-j.
Spt. Ætheris Nitrosi, . . ℥iij.
Liq. Ammon. Acetat., . . ℥ss.
Aquæ, ... q. s. *ad* ℥vj.
M. Sig.—One-sixth every 3 hours, to re-establish the renal secretion. (*Goodeve.*)

℞. Potassii Bicarb., ... ʒiijss.
Acidi Acetici, ... ℥vj.
Aquæ, ... ℥iij.
M. Sig.—Teasp. doses as required, as a diuretic. Each dose contains about gr. x of Potassium Acetate.

Urine, Clinical Examination.

Urine for Examination should be that passed in the morning, or a sample of all passed during the 24 hours.

Quantity. Normal quantity is about 50 fl. oz. in 24 hours, from which there may be considerable variation either way, according to the quantity of sweat, the fluidity of food used, etc.

Specific Gravity. If possible, take the mixed urine. Normal sp. gr. is about 1.018, *i. e.*, 18 grains of solids in each fl. oz. If sp. gr. is high, suspect sugar; if low, suspect albumin.

Color and Specific Gravity. Urine pale and copious, of sp. gr. 1.030 and above, indicates the presence of sugar. Pale and copious, sp. gr. below 1.018, is seen in hysteria, convulsions, nervous diseases. Color high, urine scanty, sp. gr. above normal,—in fevers and the uric acid diathesis. Color high, urine scanty, sp. gr. below normal,—in Bright's disease. Urine is colored *very yellow* or *greenish-yellow*, by Bile and by Rhubarb: *dark*, with odor of violets, by Turpentine: *dark*, *muddy*, *smoky*, by blood and strong coffee: *black*, by disintegrated blood, putridity of the urine, Tar, Creosote: *olive-green* or *smoky*, by Carbolic Acid and Salol: *brown*, by Arbutin: *green*, by Indigo and Salicylic Acid: *dark-green*, by Karin and Thymol: *dark-blue*, by Methylene Blue: *bluish-violet*, by Resorcin: *violet*, by Juniper: *greenish-yellow*, reaction acid, by Santonin: *reddish-purple*, reaction alkaline, by Santonin: *blood-red*, by Hematoxylon: *magenta*, by Fuchsin: *reddish-brown*, by Sulphonal.

Smell,—fragrant, indicates Cystine or Sugar: a fetid smell indicates alkalinity: the smell of violets indicates Turpentine.

Reaction,—of 24 hours' urine in health is always acid, but it may be alkaline shortly after a meal. It is often alkaline from medicine or disease. If excessively acid, examine for crystals of uric acid. If alkaline, let the test-paper dry, so as to ascertain whether the alkali be fixed or volatile.

Albumin by Heat and Nitric Acid. With Acetic Acid, or dilute Ammonia, make the urine slightly acid, if alkaline or neutral. If a precipitate appear on boiling, it may be Albumin or Phosphates. Add a drop or two of nitric acid; if the precipitate dissolve, it is phosphates; if not, it is albumin. If a deposit or turbidity disappears on heating, it consists of urates; if not, add a drop of nitric acid; if now dissolved, we have phosphates; if not, cystine. *Other Tests* are the Potassio-Mercuric Iodide, Sodium Tungstate, Potassium Ferro-cyanide, Acetic Acid, and Picric Acid; but the above described one, if carefully done, will give as good results as any.

Tests for Albumin are interfered with by the presence in the urine of alkaloids, analgen, antipyrin, benzoic acid (contained in benzoin, benzoates, balsams of Peru and Tolu, cranberries, plums, styrax), benzosol, chloroform, ba, hypnone, oil of santal, piperazin.

Bile Pigment and Bile Acids. Vogel's color-table. *Marechal's Test*, as follows: Put ʒj of urine in a test-tube, and permit one or two drops of Tinct. Iodi to trickle down along the side of the tube, held horizontally nearly, so that the two fluids may touch, but not mix. If bile pigment be present, a fine green color will at once be developed below the red Iodine layer. Noel's Test, Pettenkofer's Test, Nitric Acid Test, Oxide of Silver Test.

Chlorides. Add a drop of Nitric Acid, and then Silver Nitrate until a precipitate ceases to form. Thus estimate the amount of chlorides.

Sugar. Urine containing sugar is usually light-colored, froths readily when poured from one vessel to another, and has a high specific gravity. *Fehling's Test*, as follows: Add to the boiling urine a few drops of freshly-prepared alkaline cupric tartrate volumetric solution (Fehling's solution). If sugar be present, a yellow, orange or red precipitate of cuprous oxide will form, 10 cc. of the solution being reduced by gramme 0.05 of diabetic sugar (anhydrous glucose). For the preparation of Fehling's solution, see page 296. Much more convenient is Dr. Piffard's cupro-potassic paste, or Dr. Pavy's cupric test pellets (see Tyson on Urine, page 57), or Wyeth's compressed tablets for preparing Fehling's solution; a box of the latter costing only 50 cents, and obtainable in any good drug-store. The writer has used these tablets for several years with great satisfaction.

Pavy's Solution is a modification of Fehling's; is equally good for qualitative and volumetric testing, and is intended for those who prefer the apothecaries' weights and measures to the metric system. It is made in the same manner as Fehling's, 100 minims corresponding to ½ grain of diabetic sugar, and consists of Copper Sulphate, gr. 320; Potassium Tartrate (neutral), gr. 640; Caustic Potash, gr. 1280; and distilled Water, f℥ 20. *Other Tests* for sugar are Böttcher's Bismuth Test, the Fermentation Test, Moore's, Trommer's, Haines', the Picric Acid and the Indigo-Carmine. They are all useful, but will not be detailed here, as one good method is all that the average practitioner wants.

Tests for Sugar are interfered with by the presence in the urine of acetanilid, antipyrin, ammonium salts, arbutin (contained in epigea; kalmia, uva ursi, etc.), benzoates, betol, bromides, camphor, some carbohydrates (*e. g.* animal gum), chloral, chloroform, copaiba, creatinine, cubeb, glycerin, glycosuric acid, iodides, morphine, phenacetin, pyrocatechin, rhubarb, rumex, salicylic acid (contained in salicylates, oil of wintergreen, oil of betula and salol), senna, serum-globulin, sulphonal, turpentine, urethan, uric acid and urates. Of the foregoing, those which actually reduce the Fehling's solution are acetanilid, antipyrin, chloral, chloroform, copaiba, glycerin, morphine, rhubarb and salicylic acid.

Temporary Glycosuria may be produced by poisoning with alcohol, amyl nitrite, carbonic oxide, chloral, hydrocyanic acid, morphine, sulphuric acid.

Acetone. Add to the urine a drop of an aqueous solution of Magenta decolorized by sulphurous acid. If Acetone is present a violet color is produced, the intensity of which is proportional to the amount of acetone. In dilute solutions the coloration does not appear until after four or five minutes. If the amount of acetone be very minute the urine may be distilled, the first portion coming over being examined. In this way a very minute proportion of acetone may be detected (Chautard).

Urea. Place a drop of urine on platinum-foil, add a drop of Nitric Acid, and leave undisturbed in a cool place for a minute or two. If the urea is in excess, crystals of uric nitrate form immediately. To ascertain the percentage of urea, use the ureameter of Doremus, or that of Mayhew, manufactured by Mayer and Meltzer of London, or the ureometer sold by Parke, Davis & Co. If the latter is used the Sodium Hypobromite solution should be employed rather than the chlorinated soda solution, as the former gives the best results. These instruments are simple and accurate enough for clinical purposes. Bartley's ureometer is probably the most accurate.

Mucus and Pus resemble each other so closely under the microscope, that it is almost impossible for any one, except an expert, to distinguish between them thereby. Mucus is more cloudy and flocculent to the naked eye than pus, which is generally of a stringy consistence and thickish yellow appearance at the bottom of the vessel. The supernatant liquid being poured off, and an equal bulk of Liquor Potassæ added, the deposit, if containing much pus, becomes gelatinized, and so tough that it cannot be poured out. If mucus, Acetic Acid added coagulates it, forming delicate molecular fibres.

Other Deposits are best examined with the microscope, and compared with good plates, rather than with printed descriptions. The plates in Hoffmann and Ultzmann on Analysis of the Urine, will answer the wants of most general practitioners, but the text follows the metric system. The urinary deposits may be classified thus:—

In Alkaline Urine only.	In Alkaline or Acid Urine.	Organized Deposits.	
Calcium Phosphate	Uric Acid	Mucus	Torulæ
Ammonium Urate	Urates	Pus	Sarcinæ
Ammoniaco-	Phosphates	Blood	Vibriones
magnesian, or	Oxalates	Tube-casts	Bacteria
Triple Phosphates.	Cystine.	Spermatozoa, etc.	

Necessary Apparatus. A dozen Test-tubes. Alcohol lamp. A small porcelain dish. 2 watch-glasses. A sheet of platinum foil, ¾ inch square. 3 pipettes of different sizes, to be used only for urine. A 2 oz. graduate. Urinometer (Squibb's). Ureameter (one of the 4 named on p. 869). Litmus-paper, blue and red. The reagents mentioned above. A little Grape-sugar, for use in testing the Fehling's solution. *A Physician's Pocket Reagent Case*, intended for urinalysis at the bedside, is put up by Parke, Davis & Co., and sold at the low price of $1.50. It contains a set of Dr. Oliver's Test Papers or Pellets (preferably the latter), a color scale, specific gravity beads, two test-tubes, a pipette, and full directions for the use of the reagents.

The foregoing directions comprise all that the average practitioner will usually perform in the matter of urinary analysis. For fuller instructions the reader is referred to one of the numerous manuals on the subject, among which may be mentioned Da Costa on Medical Diagnosis, Chapter VII.—Tyson on the Practical Examination of Urine,—and Sir Henry Thompson's Clinical Lectures on Diseases of the Urinary Organs, Lecture XXIV.

Urticaria.

Antipyrin, internally, is promptly efficient in urticaria, also in the urticaria-like eruptions of children. **Chloroform,** as ointment to allay itching (R). **Potassium Cyanide,** or Hydrocyanic Acid (R). [See under PRURIGO.] **Nitric Acid,** as dilute wash, controls itching and prevents wheals (R). **Benzoin,** the compound tincture painted on the skin for itching (R). **Benzoic Acid,** gr. viij in ℥iv aquæ, as a lotion (Squire). **Sodium Phosphate,** in doses of 60 to 80 grains every 3 hours, is a valuable agent in this affection (Wolff). **Zinc Carbonate** and Zinc Oxide, āā ʒjss, Carbolic Acid ʒss, Lime-water ℥ij, Rose-water to make ℥iv, as a lotion applied freely and frequently for the itching (Id). **Sodium Salicylate,** gr. ij every ½ hour, is remarkably efficient (Smith); gr. xx thrice daily is effective. **Copaiba,** in full doses will produce urticaria, but drop-doses every ½ hour will sometimes control it (Smith). **Strychnine,** with emetics and purgatives, when the affection is chronic (Guibout). **Colchicum,** in gouty persons (R). **Lead,** in lotions to ease itching (R). **Alkalies** (R). [See under PRURIGO.] **Warm Baths,** may be employed with benefit.

Uterine Affections.

Cimicifuga, to prevent miscarriage in irritable uterus and prolapsus (R); promises to be a valuable remedy in uterine affections (Wa); is remarkably efficient in neuralgia and sympathetic pains arising from an irritable uterus, no matter what their precise character (P). **Belladonna**, with Tannin, as suppository in uterine neuralgia (R); as vaginal or rectal injections, in neuralgic or inflammatory pains (Tr). **Arsenic**, in irritable ulcers, of decided benefit; gr. $\frac{1}{20}$ ter die, after meals (Wa). **Carbonic Acid**, injected up the vagina for neuralgia of the uterus (R). **Opium**, with Starch as injection into the rectum, will subdue the pain of uterine diseases (R); gives more speedy relief than any other remedy in irritable uterus, but long-continued is one of the worst (Wa). **Iodized Phenol**, has proved the most generally efficient agent for intra-uterine use during eight years' experience, applied by hard rubber probes wound with cotton-wool; it removes cervical mucus, gives freedom from pain, softens and dilates the cervix, heals abrasions, removes induration and villosities, regulates the menses, improves appetite and digestion, acts as a general alterative, overcomes barrenness, etc., if used long enough, but rapid results are not attainable by any method of treatment (Battey). **Lead**, as plaster, for pain in the back due to uterine disease (R). **Chloroform**, spray, in uterine neuralgia (R). **Aquapuncture**, has had extraordinary success in uterine colic (B). **Baths** of warm salt water remarkably useful in nervous or inflammatory hysteralgia (Tr). [See ABORTION, AMENORRHEA, CLIMACTERIC, DYSMENORRHEA, ENDOMETRITIS, HEMORRHAGE POST-PARTUM, LEUCORRHEA, MENORRHAGIA, MENSTRUAL DISORDERS, METRITIS, METRORRHAGIA, PROLAPSUS UTERI, etc.]

Uterine Cancer.

Conium, useful as a palliative, ʒiij–iv ad Oj aquæ, as injection for the extreme pain of uterine cancer (Wa). **Arsenic**, small doses for a long time, with a strong solution of Iodine and Glycerin locally (Atlee); is believed to retard the growth of uterine cancer (Br). **Carbonic Acid**, injected vaginally, to relieve the pain (R). **Opium**, stands first in the list of palliatives, quieting irritation, allaying pain (Wa). **Morphine**, the specific action thereof upon the uterine circulation should be utilized in hopeless cases of this disease (Lutaud). [See page 405.] **Carbolic Acid**, a weak solution as injection, an excellent cleanser, healer, disinfector, and allayer of pain (R). **Bromine**, the best escharotic for destruction of the mass (E). **Glycerite of Tannin**, checks discharge and stench; is still better if mixed with glycerite of Carbolic Acid (R). **Iodoform**, with cocoa-fat as bolus inserted into excavation produced by cancer (R); gr. v–x in each bolus (W). **Iodine**, the saturated tincture thoroughly applied to the entire surface of the mass, is frequently of great use in checking hemorrhage, and seems to temporarily check the extension of the disease (E). **Chloral**, as anodyne, will agree with most persons (E); relieves the pains (W). **Chloroform Spray**, for some minutes (R). **Cannabis Indica**, to allay the pain (W). **Thyroid Extract**, used internally with apparent curative results in three cases of carcinoma of the cervix (Bell). **Surgical Measures**, are to be advised, as medicines can only serve as palliatives.

Uterine Congestion and Hypertrophy.

Aurum Salts, often beneficial in chronic metritis with scanty menstruation (B). **Ergotin**, long continued, successful in chronic metritis; lessens congestion (B); long continued has produced remarkable results in fibroids and polypi and chronic metritis, large, spongy, subinvoluted uterus (P); by interstitial injection into the cervix, has been of great benefit (G). **Carbolic Acid**, undiluted, on cotton-wrapped probe, no better treatment for uterine catarrh (B). **Iodine**, has proved the most valuable of all remedies as a local stimulant and a reliable alterative and excitant of uterine contraction ; use a saturated tincture to any part not exposed to the air (E) ; may be injected into cervix (G). **Iodo-tannin,** or Iodoformi ʒj, Ac. Tannici ℥j, a serviceable application in many inflammatory and hypertrophic conditions ; Iodoform suppositories in chronic metritis (P). **Potassium Bromide,** our main stand-by in uterine troubles; aside from its soothing properties it seems to divert the blood from the womb, and to lessen uterine congestion (G); a specific cure for simple subinvolution, the benefit being derived from the potash (Tait). **Digitalis,** in subinvolution (B). **Glycerin,** on cotton tampon to cervix as a local hydragogue (Thomas). **Glycozone,** as an application in tumefied conditions of the cervix and uterus, is far superior to pure glycerin (Edson). **Potassa,** Caustic Potassa and Potassa cum Calce, are said to be effective in chronic metritis; must be used cautiously (B). **Chromic Acid,** a strong solution to interior of uterus, a very useful application. **Ipecacuanha,** in subacute metritis of the puerperal state (Tr). **Iron,** locally in uterine catarrh (R); as a tonic, Iron and other restoratives, a cardinal rule in the treatment of all uterine disorders; with Ergot, Quinine, Arsenic or Potassium Bromide, whenever the womb as a whole is congested or hypertrophied; Syr. Ferri Iodidi, with Cod-liver Oil, wins half the battle (G). **Zinc Valerianate,** in 2- to 4-grain doses thrice daily, is one of the best nervines in these cases (G). **Mammary** and **Parotid Extracts,** used with signal benefit as internal remedies in several cases of subinvolution and menorrhagia (Bell). **Scarification,** after dry cupping, in chronic metritis (Thomas). **Electricity,** in chronic congestive enlargement, a galvanic current of moderate intensity, slowly interrupted (B). **Water,** hot injections or douche, also cold alternately, one of the most effective measures, a gallon very hot ter die (R); especially valuable in congestion, which is generally venous; elevated hips a necessary part of treatment (E); cold water is often better than hot (G). **Rest,** to the patient and the organ, is of prime importance, abdominal bandage, skirt-supporters, pessary if anteversion or retroversion, abstinence from sexual intercourse (Thomas).

℞. Ext. Humuli, ... ℥j.
Elix. Ammon. Valerianat.,
Syr. Lactucarii, ... āā ℥ss.
M. Sig.—A dessertsp. at bedtime, or during the day when needed, as an antispasmodic. (*Goodell.*)

℞. Iodi,
Potass. Bromidi, . . āā gr. xx.
Tinct. Iodi, ... ℥j.
Aquæ Destillat., q. s. *ad* ℥iv.
M. Sig.—♏xxx to be injected into the cervix by 3 to 5 punctures. (*Goodell.*)

Uterine Displacements.

Anteversion, without prolapsus, is not a malposition (F). **Ice,** locally when parts inflamed (R). **Hot-water** injections, to give tone to the vessels, essential; also valuable after reduction of malpositions (E). **Mechanical Means,** only reliable or safe in retroversion and prolapse; the sound, as a means to restore a retroverted uterus to position, cannot be regarded as free from risk, even in skillful hands (E). **Pessaries,** harmful unless expertly fitted; should be adjusted so as to restore the uterus to the normal line, where the circulation will be least obstructed, not too high ; should never be employed where cellulitis exists (E). **Cotton Roll,** as a substitute for the orthodox pessary, is far superior; use Borated Cotton in flat sheets, rolling it into a roll 2 inches long by 1 inch diameter, and saturating in Boroglyceridi ℥j, Alumini Acetatis ℥j, Glycerini Pur. q. s. *ad* Oj ; if an astringent is required, the Acetate may be replaced by Alumini Sulphas (Wylie). [Compare PROLAPSUS UTERI.]

Uterine Tumors.

Mercury, the Bichloride in small doses, long continued, of undoubted value in treatment of fibrous or polypoid growths ; gr. $\frac{1}{16}$ every 6 hours, sometimes restrains the hemorrhage when other remedies fail (Wa). **Calcium Chloride,**

in 30-grain doses thrice daily, has by prolonged use cured uterine fibroids (Hewitt); calcifies uterine arteries, also those of the body generally, and is dangerous (Tilt, Wells). **Ergotin**, hypodermically for fibrous tumor (R); gr. ij–vj on alternate days, give excellent results (B); nine cases of fibroid treated thus by Hildebrandt with good results (P); this method often causes great pain and severe local inflammation (W); one grain each of Ergotin and Ferri Sulphas Exsiccat., in pill thrice daily, persistently, for uterine fibroids, using for the hemorrhages a tampon saturated with tincture of Iodine or Monsel's solution (Parvin). **Opium**, has specific action upon the uterine circulation, and in bleeding from hopeless cases of cancer or fibroid tumors should be used freely, regardless of the opium habit (Editorial, *N. Y. Medical Record* Dec 10, 1887). **Mammary Extract**, used as an internal remedy with signal benefit in two cases of uterine fibroid (Bell). **Ammonium Chloride**, in fibrous tumors, gives more benefit than any other remedy, gr. x, twice or thrice daily, for weeks and months consecutively (Atlee). **Ferrous Subsulphate**, injected to restrain bleeding, cautiously! (B). **Saline Mineral Waters**, especially those at St. Catherine's, Canada, are useful (B). **Aliment**, carefully regulated, chiefly animal food, with recumbent posture while flowing, and long-continued use of Ergot in small doses, may accomplish something (E).

Uterine Ulceration.

Hydrastis, quickly improves; the fluid extract undiluted as a topical application in uterine and vaginal leucorrhea, ulcerations and erosion of cervix (B). **Carbolic Acid**, pure, over the surface twice a week in simple ulceration (R). **Silver Nitrate**, a serviceable application, but is often abused (B); the solid stick applied to surface, after cleansing and drying with cotton-wool (Wa). **Alum**, as hip-bath, ℔ j ad Cj, and vaginal injection, is of great utility in ulcerations of the os uteri, or of the uterine cavity (Recamier). **Glycerin** 25, Alcohol 12½, and pure Creosote 1 part, an excellent application to ulcers of the neck. **Glycozone**, as an application to ulcerated cervix, is far superior to pure glycerin (Edson). [See under LEUCORRHEA, for manner of application.] **Bismuth Subnitrate**, with enough glycerin to make a thick cream, is the best of all applications for ulceration of the os and cervix uteri (Suesserott). **Vegetable Astringents**, infusions or decoctions of Galls, Oak-bark, Hamamelis, Geranium, Alum-root, etc.; the Glycerite of Tannin, or Iodoform and Tannin, packed around the cervix (B).

Uvula.

Tannin, **Rhatany** or **Zinc**, as astringent lozenges, for relaxed uvula (A). **Cocaine** combined with extract of Krameria, in a pastille, is often very effectual as a local astringent for elongated uvula (Hall); a 20 per cent. solution applied by the spray or brush, will often suffice to give relief in acute uvulitis (Id). **Ammonium Bromide**, gr. xx ad ℥j aquæ, as gargle, is one of the best applications, being as soothing as it is astringent (Muirhead). **Amputation** of the elongated part (A); after applying a 20 per cent. solution of cocaine, by Mackenzie's uvulatome, or the uvula may be seized with forceps and a portion cut off with scissors (Hall); the hemorrhage may be severe and may recur some hours after the operation, but will be arrested by slowly sipping a mixture of Tannin ʒvj, Gallic Acid ʒij and Water ℥j (Mackenzie).

Vaccination.

Aconite, internally with **Belladonna** Ointment locally twice daily for erysipelatous redness after vaccination (R). **Zinc Oxide**, dusted over, to allay the subsequent local irritation (W); with Pulv. Amyli, equal parts, over the surface. **Lead Acetate**, ʒj to Oj water, as lotion for irritable pock (Foster). **Carbolic Acid**, ʒj to Oj water, as lotion for excessive redness, with burning and itching.

Vaginismus.

Ether, by inhalation as anesthetic, to ascertain cause, usually a displacement, fissure, or cellulitis (E). **Thiol** j and Glycerol ij, in which soak a tampon and apply for vaginal irritation (Bloom). **Iodoform**, in suppository when redness and excoriation; but **Belladonna**, the extract 1 part with 8 or 9 of fresh lard, when pain alone (Gallard). **Tents**, to gradually dilate the vagina, may be impregnated with various sedatives (Id). **Hygiene**, sun-baths, hot-water injections, fresh air, removal from husband, etc. (E). **Operation**, Sims', removal of hymen with scissors and insertion of glass plug till parts are healed, when the cicatrix is to be divided, etc. (E): Atthill removed a narrow strip of mucous membrane on each side of the vaginal orifice with marked success in a very severe case. **Cocaine**, in ointment with Morphine and Conium, smeared over the painful spot with the finger; or in a pessary with Iodoform and extract of Belladonna, may give speedy relief (Whitla).

Vaginitis.

Silver Nitrate, in solution, gr. xl to the ℥, applied within the cervical canal and over the vaginal mucous lining (E). **Pinus Canadensis**, the concentrated, colorless extract, locally, has a very soothing effect in acute vaginitis. **Tannin**, the glycerite in chronic vaginitis of children (R). **Emollients**, with Opium, as injections (Goodell). [Compare GONORRHEA, LEUCORRHEA.]

Varicella.

Ammonium Acetate, in diaphoretic and antifebrile mixture. [See under FEVER, SIMPLE, for formula.] **Inunction**, with Camphorated Oil, or thin starch, to relieve itching and allay inflammation (P). **Aconite**, is of great value (B). **Water**, hot and cold baths and packs are of great utility; cold, if hyperpyrexia; cold compress if sore throat; hot or warm pack when free diaphoresis required (B). **Diet**, no animal food, milk best, with careful attention to the bowels, patient to be kept cool with light covering, and use of a mattress rather than a feather bed, is all the treatment required (A). **Saline Mixture**, if high fever. **Quinine**, during convalescence. **Complications** are to be treated symptomatically.

Varicocele.

Hamamelis, appears to have permanently cured one case (R). **Ergot**, gr. ij–vj of Ergotin hypodermically, the needle to be inserted among the affected veins, care being taken not to puncture a vein, is effective; severe pain follows for a few hours (R). **Water**, cold douche to the perineum and buttocks, with suspension of testicles in cold water (R). **Radical Cure**, consists in obliterating the veins by wire ligatures, etc. (Cl).

Varicosis.

Hamamelis, is employed with satisfaction in varicose veins and ulcers (Pf). **Digitalis**, by fomentation, in acute inflammation from varicose ulcers (R). **Ergotin**, injected alongside of vein, but not within it, has cured (B). **Bandage**, or elastic stocking; with cold sponging and rubbing upwards, as palliatives (Cl). [Compare HEMORRHOIDS, ULCERS.]

Variola.

Treatment, in no way differs from that of the other eruptive fevers. Stokes' three indications for treatment are accepted by other authorities and are : (1) exclusion of air, (2) keeping the parts in a permanently moist state so as to prevent hardening of the scabs, (3) lessening of local irritation (Whitla). **Quinine,** small doses in adynamic states, larger doses when hyperpyrexia (B). **Iron and Quinine,** in large doses by the mouth, also Ergotin by deep parenchymatous injection, and Turpentine by the bowel, in the hemorrhagic form of the disease (Whitla); these two drugs are the most valuable antiseptics in variola (Moore). **Opium,** low, muttering delirium ; not so much used now as formerly (B) ; Morphine in the insomnia of the advanced stage, once or twice only, but not when copious salivation or mucous expectoration (Wa). **Vaccinia Antitoxin,** has been used in a few cases with much success by Béclère [see page 184]. **Cimicifuga,** is given internally by some, who assert that it prevents pitting (R). **Mercury,** in ointment or plaster, to prevent pitting in semi-confluent, or barely confluent cases (Wa) ; formerly used (R). **Camphor,** is said to restore the eruption, if retrocedent ; in confluent malignant smallpox, camphor alone, or with Opium, may be used for great depression of the vital powers (Wa). **Belladonna,** successfully used both as prophylactic and curative agent (Erasmus Wilson); gr. ½–j every 3, 4, or 6 hours, to dilatation of pupil and some stupor, found effectual (Wa). **Carbolic Acid,** is used with decided advantage (Wa) ; [see under MEASLES] ; has been much used on theoretical grounds, but not with success (B). **Ammonium Carbonate,** has had cheering success (Wa) ; [see under SCARLET FEVER]. **Chloral,** temperature high, much delirium and restlessness (B).

External Applications, as powdered starch, flour, or Zinc Carbonate, 3 parts to 1 of Zinc Oxide with Olive Oil ; cold or tepid water with vinegar, sponged over body twice or thrice daily (Wa). **Diet,** tea and dry toast, raw eggs beaten in cold milk, beef-tea, grapes, roasted apples, ripe fruits in season ; cold water may be drank freely. **Fats,** bacon fat smeared over the face, to allay itching and prevent pitting. **Silver Nitrate,** on a sharp-pointed stick, inserted into each vesicle after rupture, to prevent pitting (B) ; or simply paint skin with a solution of gr. xx to the ℥ (R). **Iodine,** the tincture to prevent pitting, is painted ten times over face if on first day of eruption, 12 if on the second day, 12–16 times if on third day (B). **Collodion,** or solutions of India-rubber or Gutta-percha in Chloroform, to prevent pitting ; or cotton-wool dipped into Lime liniment, applied to face or neck (R). **Carron Oil** [see page 235], makes a good dressing for the face. **Salicylic Acid,** ʒj in a quart of hot water, applied by sponging to the skin and by gargle to the throat every 4 hours, also used internally if much diarrhea, is my treatment and I have not lost a case of variola since adopting it (Pope). **Eucalyptus,** the Oil as inunction from the very commencement of the disease, is to be strongly recommended as an antiseptic application to the skin (Whitla). **Water,** as cold baths and cold pack, of great utility (B) ; packing especially on retrocession of rash (R). [Compare VACCINATION.]

Vertigo.

Digitalis, in small doses, alternately with tincture of Larch, and a long course of Iron Citrate and Strychnine, in essential vertigo, without any other head symptoms, and with general depraved nutrition, the most effectual treatment (Wa). **Potassium Bromide,** oftens controls paroxysmal vertigo, without coexistent spasm, or organic brain-disease (Wa). **Ammonium Bromide,** in an effervescing form with Cascarilla, for vertigo from overwork, when there are usually restlessness, insomnia, depression of spirits, with a sense of impending evil (Wa). **Alkalies and Bitter Tonics,** give the best results in vertigo of gastric origin. **Sodium Bicarbonate**, after meals, tonics before meals. **Strychnine**, with Iron, thrice daily, gives good results. **Corrosive Sublimate**, in small doses, with attention to the bowels and diet. **Cod-liver Oil**, for giddiness of the aged, when no serious brain-disease (R). **Aurum**, in vertigo and vertiginous sensations connected with gastric disorders or due to cerebral anemia, which are often removed by a course of the salts of gold (B). **Quinine**, in aural vertigo, Meniere's disease, 10 to 15 grains daily, continued with intervals for several weeks (Charcot). **Electricity**, the constant current daily, anode over cervical vertebræ, cathode over the ear, the current strength being gradually increased to toleration and continued from 3 to 5 minutes at a sitting, is of great benefit in aural vertigo, ameliorating the condition in most cases. **Nitro-glycerin**, gives good results in epileptic vertigo (Br). **Vertigo**, is usually symptomatic of disorder of the stomach, or of the liver (cholemia), sometimes of general debility, rarely of disease of the brain (H).

Vomiting.

Arsenic, in many forms of gastric vomiting, especially that of alcoholism and chronic ulcer (B), and in the vomiting of cholera (R); gtt. ss of Fowler's solution, every ½ hour for 6 or 8 doses, often relieves vomiting after a debauch, the morning vomiting of drunkards, and that of pregnancy (Smith). **Nux Vomica**, stands next to Arsenic, is useful in many ways (B); may be given with Ipecac, especially when tongue coated (R). **Ipecacuanha**, in small doses, will arrest certain kinds—a curious fact; especially useful in certain forms, ♏j of Vinum Ipecac. every ½ hour or more (B, R, P); in sick stomach of nervous origin, minute doses are of undoubted value (W). **Cocaine**, in doses of gr. ¼ thrice daily, controlled the vomiting of gastric carcinoma, after all other means failed (Meigs); 10-minim doses of a 4 per cent. solution every hour, of inestimable value in the vomiting of yellow fever (Jennings); in 2 per cent. solution sprayed high up the nasal passages [see under NAUSEA]. **Potassium Nitrate**, one of the surest remedies against vomiting and nausea, gr. ¼ in ℥ss of cold water every 4 or 5 minutes until relieved, in all cases except reflex ones and those due to irritant poisons (Moore). **Mercury**, gr. ½ of Gray Powder every two hours, especially in children with clayey stools (R); Calomel, gr. j to Oj aquæ, first dissolved in ℥j of Lime-water, a teasp. every ten minutes for the regurgitation of food in nursing children (Smith). **Opium**, will arrest many kinds, best in that of biliary or renal calculi, dysmenorrhea, sea-sickness, pregnancy; Morphine, hypoder. gr. $\frac{1}{12}$ to $\frac{1}{6}$ (P). **Codeine**, in doses of gr. ¼, usually answers exceedingly well in vomiting from almost any cause (Braithwaite). **Bryonia**, for bilious vomiting and headache (P). **Veratrum Album**, in vomiting and purging of summer diarrhea (R). **Hydrocyanic Acid**, often very serviceable in nervous vomiting, acts promptly if at all (R). **Hydrobromic Acid**, ʒss in ℥j of water, four times daily, useful for the vomiting due to gastric ulcer. **Chloroform**, ♏ij–v, on sugar, for noninflammatory vomiting (R); [see under YELLOW FEVER for formula]. **Bromides**, in cerebral vomiting only; not in the gastric form (B); Potassium Bromide in that of uterine disease (W); Strontium Bromide is excellent in vomiting due to various causes; gr. x–xv twice daily with meals. **Phenocoll**, with Piperazin, in a case of uncontrollable vomiting which had resisted every known remedy. **Menthol**, has successfully checked persistent vomiting after all the usual remedies had failed in the hands of many well-known observers; ♏x of a 20 per cent. solution in Olive Oil, dropped on powdered sugar, each dose being about 1 grain (Weil). **Sulphurous Acid**, ♏v–ʒj, well diluted, or less effectively Sodium Sulphite; Sulphites often curative in vomiting of sarcinæ and acid matter, due to acid fermentation of starchy elements (B). **Cocculus Indicus**, efficient in cephalic vomiting (P). **Iris**, in vomiting with blinding right supraorbital pain, liver deranged (P). **Bismuth**, in many forms of vomiting in children, especially when from gastric catarrh (R). **Carbolic Acid,** with or without Bismuth (B); in nervous vomiting (W). **Creosote,** in the vomiting of cancer, gastric ulcer, etc. (R); gtt. j–ij (W). **Cinnamon or Cloves,** will check vomiting (P). **Calumba,** in vomiting from kidney disease and renal calculi; frequently allays that of pregnancy and dentition (P). **Serpentaria,** for bilious vomiting (P). **Cerium Oxalate,** in that of pregnancy and from cancer (B); gr. j every three hours (R). **Ammonium Carbonate,** may relieve vomiting when the ejected matter is acid (B). **Peptenzyme,** is highly efficient. **Pepsin,** for vomiting of food after meals, gr. x–xv before or during meals. **Lime-water,** is a favorite remedy for vomiting, especially in children: Milk and Lime-water often relieve when other methods fail (B). **Sodium Bicarbonate,** ʒss–j to a pint of milk, for infants, especially if constipated (R); the effervescing soda powders in the vomiting of acute diseases and the exanthemata (B); the severe vomiting of acute disease is often controlled by ʒ doses in plenty of hot water. **Kumyss,** proves effective when no other food will be retained. **Carbonated Water,** is an efficient remedy. **Ice,** sucked, with horizontal posture, also absolute rest and quiet (Wa); iced champagne, ℥ss every ¼ hour (B). **Alcohol,** iced brandy or champagne in spoonful doses every ½ hour in vomiting of cholera, pregnancy, and delirium tremens (B). **Counter-Irritation,** at epigastrium (R). **Nutrient Enemata,** [see under ENEMATA]. [Compare the list of Anti-emetics, on page 49, also the articles entitled CHOLERA, HEMATEMESIS, NAUSEA, SEA-SICKNESS, VOMITING OF PREGNANCY.]

℞. Ac. Hydrocyan. Dil., . . ʒj.
Aquæ Laurocerasi, . . . ℥ij.
M. Sig.—A teasp. every 2 hours, for nervous vomiting.

℞. Ac. Hydrobromici Diluti, ℥ij.
Sig.—Half a teasp. in a wineglassful of water, 4 times daily.

Vomiting of Pregnancy.

Ipecacuanha or **Nux Vomica,** either will generally succeed where the other fails (R); no other remedy of equal value to Ipecac (P); [see under VOMITING]. **Nux Vomica,** is useful but often fails, gtt. ss–j every hour or two in water (R); in very minute doses (S); gtt. ij–iij of the tincture every two or three hours, or gtt. x before each meal, with very hot water as a drink, is the best treatment (Parvin). **Arsenic,** fowler's solution, gtt. j before each meal, will often relieve, when vomiting of food, retching and straining, with blood and pain (B). **Creosote,** checks the vomiting (R). **Carbolic Acid,** drop-doses of crystals, liquefied by heat, in mucilage ter die (Wa). **Staphisagria,** has subdued when other remedies failed (P). **Cerium Oxalate,** gr. j every three hours (R); ordinary doses far too small, give as high as 10 grains (B). **Morphine,** hypodermically, in severe vomiting (R). **Pepsin,** has been used with success. **Ingluvin,** seems almost specific (B). **Potassium Bromide,** is often efficacious (W); ʒss doses thrice daily, exceedingly effective in the combined diarrhea and vomiting of pregnancy; the first dose should be given an hour before rising. **Strontium Bromide,** proved entirely successful in severe cases; gr. xv in water with meals, twice daily, for a month. **Hydrocyanic Acid,** often the best remedy (P); [see under VOMITING]. **Copper Sulphate,** sometimes effective, not more than gr. $\frac{1}{20}$ ter die (B). **Iodine,** ♏v of the tincture in ℥ss of sweetened water repeated in ½ hour, of magical effect in a bad case which had resisted every other treatment; is often useful (B). **Menthol,** has proven very successful in obstinate cases [formula on next page]. **Cocaine,** locally to cervix, cured a most intractable case of several months' duration, though it failed when used internally (Boys); has given excellent results when used internally in triturates of $\frac{1}{10}$ grain each [or see formula on next page]: a 2 per cent. solution sprayed high up the nasal passages [see under NAUSEA]. **Calumba,** as tincture often useful, drop-doses every hour or two (B). **Bismuth,** and Carbolic Acid are effective (B). **Atropine,** frequently effective (R); never failed to give relief in many years of using it (Boys). **Ether**, sprayed over the epigastric region and the corresponding part of the spinal column, for 3 to 5 minutes every 3 hours, gives immediate relief (Lubelsky). **Pop-corn**, is a godsend to this complaint, having acted marvelously in several cases in which I have used it (Sweringen). **Peptenzyme**, is said to be very efficient. **Aconite**, in full doses, is often very successful (W). **Dilatation**, of the cervical canal, by the index finger, is regarded as extremely efficient, and reasonably safe; it may bring on abortion, if too extensive, but from records of several cases since 1875, it may be said that it is a safe and sure remedy (Copman). **Ice-bag** to spine, an efficient measure (R). **Vesication**, a single blister over the 4th and 5th dorsal vertebræ, never failed for many years to put an end at once to the sickness of pregnancy for the whole remaining period of gestation (Harkin).

℞. Atropinæ Sulphatis, . . . gr. j.
Morphinæ Sulphatis, . . . gr. iv.
Acidi Sulphurici Aromat., ʒ iij.
Aquæ, ... ℥ v.
M. Sig.—Ten to twenty drops, thrice daily. (*Boys.*)

℞. Bismuthi Subnitrat., . . . gr. clx.
Cerii Oxalatis, ... gr. xl.
Morphinæ Sulphatis, . . gr. jss.
Syrupi, et Acaciæ, q. s. *ad* ℥ ij.
M. ft. emulsum. Sig.—A teasp. every hour until vomiting ceases. (*Van Valzah.*)

℞. Mentholi, ... gr. xx.
Alcoholis, ... ʒ vjss.
Syr. Simplicis, . q. s. *ad* ℥ ij.
M. Sig.—ʒ j every hour. (*Potter.*)

℞. Cerii Oxalatis, ... gr. xij.
Ipecacuanhæ, ... gr. xv.
Creosoti, ... gr. xxiv.
M. Ft. pil. no. xij. Sig.—One pill every hour. (*Goodell.*)

℞. Cerii Oxalatis, ... gr. xxiv.
Ext. Hyoscyami, ... gr. xxxvj.
M. Ft. pil. no. xij. Sig.—One pill twice daily. (*Goodell.*)

℞. Cocainæ Hydrochlor., . . gr. xv.
Acidi Carbolici, ... ♏x.
Aq. Cinnamomi, ... ℥ ss.
Syr. Zingib., . . q. s. *ad* ℥ j.
M. Sig.—10 drops gradually increased to 20, in a little water every hour until relieved, then every 2 or 3 hours. (*Potter.*)

Vulva and Vulvitis.

Sodium Hyposulphite, an unfailing remedy in lotion for aphthæ of the vulva (R). **Arsenic**, much used for eczema (T). **Lead Acetate**, a concentrated solution in glycerin locally for eczema of vulva (T). **Alum**, as lotion in vulvitis of children; gr. lx to Oj aquæ, or less strong if found to increase discharge (R). **Lead**, solutions of the Acetate as wash, after the acute stage has subsided. **Lime-water**, as wash (R). [Compare PRURITUS, PRURIGO, VAGINITIS.]

Warts.

Chrysarobin, a 10 per cent. solution in ether or liquor gutta-perchæ, after having pared the wart down with fine glass-paper; is a specific application (Fitz). **Thuja**, is highly effective for the cure of warts having a narrow base and a pendulous body; the strong tincture applied locally thrice daily, also ♏v in a wineglassful of water internally night and morning (P). **Iron**, the tincture of the Chloride and dilute HCl Acid, equal parts applied night and morning, very effective (Bulkley). **Nitric Acid**, ʒj–ij of the dilute acid to a pint of water, as wash to keep small syphilitic warts constantly moist (R). **Sabina**, as caustic (P); 1 part to 2 of Alum (Wa). **Rue**, the Oil, with honey, locally (P). **Arsenous Acid**, as a caustic; enough to be used to excite active inflammation; or Liq. Arsenicalis painted over warts (R); may be taken internally (B). **Mercurial Ointment**, containing 5 per cent. of Arsenic, or a plaster having in each 8 square inches 154 grains of Arsenic and 77 grains of Mercury (Unna). **Tannin**, and **Burnt Alum**, equal parts, powdered over warts twice daily, gives good results. **Chromic Acid**, gr. c to ℥j aquæ, with a glass rod, to saturate diseased growth; remove any superfluous acid, dress with dry lint (R, Wa). **Mercuric Nitrate**, locally (R). **Silver Nitrate**, as caustic, but is usually too superficial (R). **Dermal Curette**, is much used in Vienna to remove warts by enucleation. **Strangulation** by tying a string tightly around the base, will cause them to drop off in a few days. **Heat**, is a most thorough measure for their radical removal; it may be best applied by touching the wart 3 or 4 times daily with the hot end of a cigar; the first few applications only give pain. **Caustic Alkalies**, locally (R); a saturated solution of Potassa Fusa, carefully applied by a brush or sponge fastened to the end of a stick, is to be preferred (Wilson). [Compare CONDYLOMATA.]

Wen.

Extirpation, the least troublesome and most speedily effective method. Run a scalpel through it, seize the cut edge of the cyst, and gently tear it out with a touch or two from the knife. Dressing of lint and Carbolic Oil to cause suppuration and contraction (D).

Worms.

Santonin, the best anthelmintic, a laxative in the morning, fast all day, a dose of Santonin, gr. ss–v, and Calomel, or Troches of Santonin, j–x, at bedtime, a Senna draught next morning, for ascarides (P); for round and thread-worms, give in Castor Oil by mouth, or as injection (R). **Iron**, the syrup of the Iodide internally and a solution of the tincture locally, for ascarides (B); the Tinct. Ferri Chlor. ℥ss ad Oj aquæ, a good injection for thread-worms, coagulating their albumin (R). **Quassia**, the infusion an effectual injection, conjoined with simple bitters internally, for ascarides (R). **Lime-water**, as injection for thread-worms (R); ℥iij–iv repeated, for ascarides (Wa). **Sodium Chloride**, in ʒss doses on empty stomach, expels ascarides and prevents reproduction (Wa). **Quinine**, as a tonic, also cold sponging, out-door exercise and judicious diet; useful probably by preventing the production of the abundant mucus which favors the growth of worms (R); especially useful for ascarides, also as injection for thread-worms and teniæ (Wa). **Ignatia**, for convulsive symptoms (P). **Eucalyptus**, as injection, for ascarides (B). **Aloes**, are efficacious for ascarides (P). **Scammony**, for thread-worms in rectum (R); with Calomel, effective (Wa). **Tannin**, as Catechu, Kino, Red-gum, Rhatany, Hematoxylon in injections, to destroy thread-worms (R). **Alum**, as solution for injection (R). **Ammonium Chloride**, to prevent formation of thick mucus which serves as nidus for worms (R). **Valerian**, especially when convulsions (R). **Myrtol**, is efficient against ascarides and round worms (B). **Thymol**, is almost specific against the ankylostomum duodenale, given in doses of gr. x–xxx, well triturated and in capsules, repeated 3 or 4 times; but no alcoholic drink afterwards lest the drug be absorbed and poisoning ensue (Mn). **Filix Mas**, to be taken on an empty stomach for tape-worm, and followed by a purge (P). **Pepo**, ℥ij as emulsion, taken fasting, one of the most efficient remedies against teniæ (B). **Pelletierine**, the alkaloid of Granatum, is by far the best vermifuge for a tape-worm, repeated after a week for a second worm, as many as 3 having been found in one patient (Da C); gr. xv–xx of the Tannate, followed in a few hours by Castor Oil (R). **Chloroform**, a very efficient teniafuge, ʒj in ℥j of mucilage, after 20 hours' fast, followed one hour later by ℥j of Castor Oil, this is an adult dose, ʒj should never be exceeded (Wilde). **Kamala (Rottlera)**, excellent for teniæ, requires no purge (P); gr. cl–clxxx for an adult (Wa). **Cusso**, the fluid extract in dose of ʒij to ℥j, or the same quantity of the flowers infused in ℥iv of boiling water, for both varieties of the tape-worm [see page 299]. **Naphtalin**, an excellent all-round anthelmintic, of high value for ascarides and teniæ, thoroughly reliable for all kinds of intestinal worms, giving prompt and complete results invariably, with entire absence of all unpleasant symptoms; a single dose of gr. xv removed tape-worms entire (Mirowicz);

for adults a dose of Castor Oil should follow, but for children it is preferable to give both together (see page 387). **Potassium Iodide**, gr. xxxvj, Iodine, gr. xij, Water ℥j, ten drops thrice daily in water, caused the expulsion of a tapeworm 11 yards long, of which there were no previous symptoms, and proved successful in other cases (Newington). **Ailanthus**, a decoction of the fresh bark, for teniæ (B). **Turpentine**, as poison for tape- and thread-worms (R); for teniæ (Wa). **Tonics**, as Iron, Cod-liver Oil, etc., to restore the intestinal canal to a healthy condition (R). [Compare CHYLURIA, also the List of Anthelmintics on page 36.]

℞. Chloroformi,
Ext. Filicis Maris, . . . aa ʒj.
Emulsi Ol. Ricini (50 per cent.), ... ℥iij.
M. Sig.—One dose after 24 hours' fasting. Acts just as well if the Male Fern be omitted. (*Smith.*)

℞. Ext. Spigeliæ Fl., ... ℥j.
Ext. Sennæ Fl., ... ʒss.
M. Sig.—A teasp. to a child of 3 to 5 years. (*Smith.*)

℞. Ext. Spigeliæ et Sennæ Fl., ℥j.
Santonini, ... gr. viij.
M. Sig.—A teasp. to a child of 5 years. (*Smith.*)

℞. Granati Corticis, . . . ℥ij.
Ft. infusum. Sig.—To be taken before 11 A. M., and followed after 2 hours by—

℞. Ol. Ricini, ... ℥iij.
Ol. Terebinth., ... ʒj.
Ext. Filicis Maris Æther., ʒj.
M. ft. haustus.
Fasting unnecessary. (*Wilde.*)

℞. Magnesii Sulphat., . . . ℥ij.
Sodii Chloridi, ... ʒss.
M. Sig.—An ounce in half a glass of water, with gtt. v of Carbolic Acid, night and morning, for ascarides. Persevere. (*Barkley.*)

Wounds.

Arnica, is very useful for external bruises and cuts, also for internal injuries; unites surfaces very rapidly after amputations; the infusion or decoction best (P); very effectual (Wa). **Aconite**, valuable in surgical fever (P). **Bismuth Subiodide**, dusted into a wound one of the most efficient antiseptics, non-irritant, and a prompt stimulant of granulation; an excellent dressing for wounds after approximation of the edges, the powder to be dusted thickly over the edges and thoroughly covered with flexible collodion. **Dermatol** (Bismuth Subgallate), is an excellent non-irritant vulnerary, having great stability and valuable drying and bactericidal qualities. **Europhen**, is an ideal application to sores and wounds, also for the many protective requirements of minor surgery; is used as a dusting powder, or as a 5 to 10 per cent. ointment, with Lanolin as a base. **Aristol**, is very efficient, or a mixture of Aristol and Europhen, equal parts of each; Aristol is an excellent substitute for Iodoform, and odorless. **Acetanilid**, in fine powder dusted over the surface of wounds and other breaches of tissue [see page 79.] **Alumnol**, a powerful astringent, desiccant and antiseptic, reaches the deep recesses of wounds [see page 144]. **Iodoform**, powdered and dusted over sloughing wounds, irritable and ill-conditioned ulcers and sores (B); Iodoform 1, Collodion 9 parts, painted on a superficial wound while edges are held together (Gross); may be painted over edges when stitched together; gives excellent results. **Mercury**, the Bichloride, gr. vijss to quart j of hot water, stirred with a stick, makes a solution of 1 to 2000; the best of all antiseptics for washing a wound or cavity, and for saturating the dressings. **Carbolic Acid** solutions [see page 84] check suppuration and correct fetor (B); its employment as an antiseptic has become much restricted and most surgeons have abandoned it. **Boric Acid**, in lotion or ointment successfully used as dressings for wounds, a solution of 1 in 133 arresting the activity of bacteria; is applicable for the same purposes as carbolic acid (B). **Boro-glyceride**, in aqueous solution, 1 to 40, as a lotion for wounds. **Sulphurous Acid**, in solution, diluted or not, constantly applied (R); in solution or by fumigation, is regarded by some as superior in efficacy to carbolic acid, and less irritant (Wa). **Salicylic Acid**, Thiersch prefers it to carbolic; may be applied pure in powder to gangrenous and sloughing wounds (B). **Formalin**, is now the favorite surgical antiseptic [see page 324]; but cannot replace the Bichloride of Mercury. **Aloes**, pulverized fine, is an efficient dressing for wounds, closing them and favoring cicatrization, also relieving the pain at once, requires removal only at long intervals (Millet). **Nitric Acid**, as escharotic for gangrene (B). **Turpentine**, one of the most efficient applications in hospital gangrene (B). **Balsam of Peru**, excellent for closing recent wounds (P). **Benzoin**, the basis of all the healing balsams (P). **Aloes**, topically as a slight stimulant; often purges (R). **Gum Tragacanth**, a thick aqueous solution to granulating surfaces, to protect them from the air (Wa). **Opium**, internally to quiet intestinal movements in wounds of the abdomen (R); forwards the reparative processes (P). **Tannin**, or Glycerite of Tannin, to coat over wounds (R). **Collodion or Liquor Gutta-perchæ**, to secure primary union of incised wounds (B); as protective covering (P). **Ammonium Carbonate**, gr. v hypodermically in the vicinity of wounds caused by poisoned arrows, repeatedly used with success in saving life by Dr. Parke, the surgeon of Stanley's last expedition in Africa. **Galvanic Couplet**, to wounds of indolent form (B). **Alcohol**, an excellent antiseptic dressing when suppuration; favors cicatrization of open wounds (B). **Poultices**, are often abused; of Yeast or Charcoal best for foul wounds (B). **Water**, in universal use as dressing; cold water often abused, hot-water dressing as advocated by Hamilton, promises better results (B). **Turkish Baths**, for pain in the seat of old wounds (R). **Ice and Salt**, applied to wounds prevent inflammation (R). [Compare BEDSORES, GANGRENE, HEMORRHAGE, INFLAMMATION, SEPTICEMIA, SURGICAL FEVER, ULCERS.]

℞. Acidi Tannici, ... ℥ij.
Alcoholis Absolut., . . ℥ss.
Ætheris, ... ℥ijss.
Collodii, ... ℥xij.
M. Sig.—Styptic Collodion.

℞. Collodii, ... ℥j.
Olei Ricini,
Acidi Carbolici, . . . āā ℥ss.
M. Sig.—Carbolized Collodion, for use on wounds.

Yellow Fever.

Treatment must all be done at the beginning, no time to be lost; cold sponging early and frequently repeated, Calomel, Quinine and Salines at the start, Potassium Acetate for the kidneys, Morphine for gastric irritation, the feet to be in mustard water (Da C). **Diaphoretics** and **Diuretics**, also **Laxatives**, are very important throughout the disease (Da C). **Pilocarpine**, in dose of gr. $\frac{1}{4}$ hypodermically, in the first stage, carried to the induction of emesis and catharsis, as well as that of diaphoresis, the most efficient treatment known, absolutely jugulating the paroxysm (Habersmith). **Mercury**, a Calomel purgative, gr. ss, 2 or 3 times on the first day, followed by a warm-water enema, is good treatment (B); has many advocates, and many opponents (Wa); should generally be abstained from (S). **Duboisine**, gr. $\frac{1}{80}$, subcutaneously, the most efficient hypnotic and calmative (B). **Turpentine**, when cardiac weakness, depression of vaso-motor system, dissolved state of the blood, ♏x–ʒss; small doses, with Tinctura Ferri Chloridi, in the hemorrhagic form (B). **Quinine**, has some strong evidence in its favor as an abortive agent, one large dose, gr. xxx–xl, with Opium at outset (Wa); is not a specific; may hasten recovery in mild cases (S); gr. xx per rectum, to reduce temperature (B). **Lime-water**, with milk, has been found efficient for the vomiting (Wa). **Capsicum**, to obviate the black vomit, is highly spoken of (Wa). **Cocaine**, for the vomiting, nothing equals it in efficiency, it also acting as a diuretic, 10-minim doses of a 4 per cent. solution, by mouth, every hour for 2 or 3 doses, acts like a charm (Jennings). **Chloroform**, for the vomiting, a few drops to prepare the stomach for reception and retention of food; its effects transitory, has to be repeated before each meal (Wa); the Ammoniated Chloroform in zymotic pyrexia, its action is sedative, analgesic and antipyretic (Richardson). **Carbolic Acid,** by stomach and hypodermically, remarkably efficacious, even after the ominous "coffee-grounds" vomit (Lecaille). **Chlorodyne,** is excellent for restlessness, insomnia, irritability of stomach (A). **Veratrum Viride,** gtt. j–x hourly according to age, till pulse and temperature are subdued; successfully used in connection with Mercury, etc. (White and Ford). **Alkalies,** to counteract the hyperacidity of the gastric and intestinal contents; Sodium Bicarbonate gr. cl, Hydrargyrum Chlor. Corr. gr. ⅓, in a quart of water, of which ℥jss is given every hour; of 301 white cases so treated only 7.3 per cent. died, and of 72 blacks all recovered (Sternberg); this plan of treatment promises well (Mn). **Morphine,** is dangerous and must be avoided (Id). **Stimulants,** only in the typhus form (B); in third stage must be bold, prompt, and continued (Da C). **Diet,** of the blandest description (A); Milk and Lime-water, half and half, in small quantities, is the best aliment; in convalescence, the utmost care is necessary in giving aliments (B). **Rest** is very important (Da C). **Iced Champagne,** in tablespoonful doses every ¼ hour, for the vomiting (B). **Purgation,** throughout the disease (Da C); is beneficial at the very onset, but must not be repeated nor given at all after the second day of the disease (Mn). [Compare REMITTENT FEVER.]

℞. Potassii Carbonat., . . . gr. xx.
Tinct. Opii Camphorat., . ʒj.
Aquæ, ... ℥viij.
M. Sig.—℥j every hour or two, as a diaphoretic. (*Dickson.*)

℞. Chloroformi,
Tinct. Camphoræ, . . āā ℥ss.
M. Sig.—Two drops as required for the vomiting.

APPENDIX

LIST OF CONTRACTIONS AND LATIN PHRASES USED IN WRITING PRESCRIPTIONS, WITH THE CORRESPONDING ENGLISH EQUIVALENTS.

Contraction.	Word or Phrase.	English Equivalent.
aa.	Ana	Of each.
Abd.	Abdomen, *gen.* inis	The belly.
Abs. feb.	Absente febre	Fever being absent.
Acc.	Accurate	Accurately.
Acerb.	Acerbus, a, um	Sharp, sour, harsh (to the taste).
Acerbit.	Acerbitas, *gen.* atis	Sourness.
Ad	Ad (*prep. gov. acc.*)	To, up to.
Ad concil. gust.	Ad conciliandum gustum	To suit the taste.
Ad 2 vic.	Ad duas vices	At twice taking.
Ad sec. vic.	Ad secundum vicem	For the second time.
Ad 3 tiam vic.	Ad tertiam vicem	For the third time.
Add.	Adde, Addantur	Add, Let them be added.
Add.	Addendus, Addendo	To be added, By adding.
Add. c. trit.	Adde cum tritu	Add with trituration.
Ad def. an.	Ad defectionem animi	To fainting.
Ad grat. acid.	Ad gratam aciditatem	To an agreeable sourness.
Ad grat. gust.	Ad gratum gustum	To an agreeable taste.
Adhib.	Adhibendus	To be administered.
Adjac.	Adjacens	Adjacent.
Ad lib.	Ad libitum	At pleasure.
Admov.	Admove, Admoveatur	Apply, Let it be applied.
Ad part. dolent.	Ad partes dolentes	To the painful (aching) parts.
Ad sat.	Ad saturandum	To saturation.
Adst. feb.	Adstante febre	The fever being on.
Adv.	Adversum	Against.
Æg.	Æger	The sick one, the patient.
Aggr. feb.	Aggrediente febre	While the fever is coming on.
Agit.	Agita	Shake, stir.
Agit.	Agitetur	Let it be shaken or stirred.
Agit. ante sum.	Agita ante sumendum	Shake before taking.
Agit. vas.	Agitato vase	The vial being shaken.
Alb.	Albus, a, um	White.
Aliq.	Aliquot	Some.
Alt.	Alter	The other.
Alt. hor.	Alternis horis	Every other hour.
Alut.	Aluta	Leather.
Alv.	Alvus	The belly, the bowels.
Alv. adst.	Alvo adstricta	The bowels being confined.
Amp.	Amplus	Large.
Ampul.	Ampulla	A large bottle.
App.	Appone, Applica	Apply, Lay *or* put on.
Aq.	Aqua, *gen.* æ	Water.

Contraction.	Word or Phrase.	English Equivalent.
Aq. astr.	Aqua astricta	Frozen water.
Aq. bull.	Aqua bulliens	Boiling water.
Aq. com.	Aqua communis	Common water.
Aq. ferv. *vel* calid.	Aqua fervens *vel* calida	Hot water.
Aq. fluv.	Aqua fluviatilis	River water.
Aq. font.	Aqua fontana *vel* fontis	Spring water.
Aq. gelid.	Aqua gelidus	Cold water.
Aq. mar.	Aqua marina	Sea water.
Aq. niv.	Aqua nivialis *vel* nivalis	Snow water.
Aq. phag.	Aqua phagedænica	Yellow wash.
Aq. pluv.	Aqua pluvialis	Rain water.
Aq. pot.	Aqua potabilis	Drinkable water.
Aq. satur.	Aqua saturni	Lead-water.
Aq. urb.	Aqua urbis	City water.
Aqual.	Aqualis	Pertaining to water.
Aquil. alb.	Aquila alba	Calomel.
Aut	Aut	Or.
B. A. *vel* Bal. ar.	Balneum arenæ	Sand-bath.
B. M. *vel* Bal. mar.	Balneum maris	Salt-water bath.
B. V. *vel* Bal. vap.	Balneum vaporis	Vapor-bath.
Bals.	Balsamum	Balsam.
B. B.	Barbadensis	Barbadoes.
Bene	Bene	Well, good.
Bib.	Bibe *vel* Bibatur	Drink (thou), Let it be drank.
Bid.	Biduum	Two days.
Bis	Bis	Twice.
Bis die	Bis in die *vel* dies	Twice a day.
Bol.	Bolus	A large pill.
Bon.	Bonus	Good.
Brach.	Brachium	The arm.
Brev.	Brevis	Short.
Bul.	Bulliat *vel* Bulliant	Let it (or them) boil.
But.	Butyrum	Butter.
C.	Cum	With.
Cærul.	Cæruleus, *gen.* i	Blue.
Calef.	Calefactus, *gen.* i	Warmed.
Calom.	Calomel *vel* Calomelas	Mild Chloride of Mercury, Calomel.
Calor.	Calor, *gen.* oris	Heat, warmth.
Cap.	Cape, Capiat	Take (thou), Let him take.
Cap. quant. vis	Capiat quantum vis	Let him take as much as he will.
Capil.	Capillus, *gen.* i	A hair.
Capsul.	Capsula, *gen.* æ	A capsule.
Caput	Caput, *gen.* Capitis	The head, Of the head.
Carbas.	Carbasus, *gen.* i	Linen, lint.
Caute	Caute	Cautiously.
Cc.	Centimeter cubicum	Cubic centimeter.
Ccu.	Cucurbita	A cupping-glass.
Celer.	Celeriter	Quickly, immediately.
Cena.	Cena *vel* Cœna	Supper.
Chart.	Charta	Paper.
Chart. cerat.	Charta cerata	Waxed paper.
Chartul.	Chartula	A small paper.
Chin.	Chininum	Quinine.
Cib.	Cibus, *gen.* i	Food, victuals.
Circit.	Circitu	Near, around, about.
Cit.	Cito	Quickly.
Cito disp.	Cito dispensetur	Let it be dispensed quickly.
Clar.	Clarus, a, um	Bright, clear.
Claus.	Clausus, a, um	Closed, inclosed.

Contraction.	Word or Phrase.	English Equivalent.
Coch., Cochleat.	Cochleare, Cochleatim	A spoonful, By spoonfuls (ʒj).
Coch. amp.	Cochleare amplum	A dessertspoonful (ʒij).
Coch. mag.	Cochleare magnum	A tablespoonful (℥ss).
Coch. med.	Cochleare medium	A dessertspoonful (ʒij).
Coch. parv.	Cochleare parvum	A teaspoonful (ʒj).
Coct.	Coctio	Boiling.
Cog.	Cogantur	Let them be combined.
Col.	Cola	Strain.
Colatur.	Colaturæ	Of the strained liquor.
Colat.	Colatus	Strained.
Colent.	Colentur	Let them be strained.
Colet.	Coletur	Let it be strained.
Coll.	Collum, *gen.* i	The neck.
Collun.	Collunarium, *gen.* i	A nasal wash.
Collut.	Collutorium	A mouth-wash.
Collyr.	Collyrium	An eye-wash.
Coloret.	Coloretur	Let it be colored.
Commis.	Commisce	Mix together.
Commod.	Commode	Rightly, properly, suitably.
Comp.	Compositus	Compound, compounded.
Con., Concis.	Concisus	Cut.
Concus.	Concuscus, *gen.* i	Shaken.
Concut.	Concuti, Concutiatur	Shake, Let it be shaken.
Conf.	Confectio	Confection.
Cong.	Congius	A gallon.
Conquas.	Conquassando	By vigorous shaking.
Cons.	Conserva, Conserve	A converse; Keep, preserve.
Consperg.	Consperge	Dust, sprinkle.
Contere	Contere	Rub together.
Cont. rem.	Continuentur remedia	Let the medicines be continued.
Contus.	Contusus	Bruised.
Coq.	Coque, Coquantur	Boil, Let them be boiled.
Coq. ad med. consump.	Coque ad medietatis consumptionem	Boil to the consumption of half.
Coq. S. A.	Coque secundum artem	Boil according to art.
Coq. in S. A.	Coque in sufficiente aquæ	Boil in sufficient water.
Coq. simul	Coquentur simul	Boil them together.
Cor	Cor, *gen.* cordis	The heart, Of the heart.
Cort.	Cortex, *gen.* corticis	The bark, Of the bark.
Cot.	Cotula	A measure.
Cox.	Coxa	The hip.
Cras	Cras	To-morrow.
Cras mane sumend.	Cras mane sumendus	To be taken to-morrow morning.
Cras nocte	Cras nocte	To-morrow night.
Cras vesp.	Cras vespere	To-morrow evening.
Crast.	Crastinus	For to-morrow, early.
Cru.	Cruor	Blood, gore.
Cucur.	Cucurbitula	A cupping-glass.
Cuj.	Cujus, Cujus-libet	Of which, Of any.
Cum	Cum	With.
Curs. hod.	Cursu hodie	During the day.
Cyath., C. vinar.	Cyathus, *vel* C. vinarius	A wine-glass (℥j–ij).
Cyath. theæ	Cyatho theæ	In a cup of tea.
D.	Dies, Dosis	A day, A dose.
Da, Det.	Da, Detur	Give, Let it be given.
De	De (*prep. gov. ablative*)	From, down.
Deaur. pil.	Deaurentur pilulæ	Let the pills be gilded.
Deb. spiss.	Debita spissitudo	To a proper consistence.
Deb.	Debitus, a, um	Due, proper.

Contraction.	Word or Phrase.	English Equivalent.
Dec.	Decanta	Pour off.
Decem	Decem, decimus	Ten, The Tenth.
Decoct.	Decoctum	A decoction.
Decoq.	Decoque	Boil down.
Decub.	Decubitus	Lying down.
De d. in d.	De die in diem	From day to day.
Dein	Dein *vel* Deinde	Thereupon; afterward, then.
Deglut.	Deglutiatur	Let be swallowed.
Dej. alv.	Dejectiones alvi	Stools.
Dejic.	Dejiciatur	Let be purged.
Dent.	Dentes; Dentur	The teeth; Let them be given.
Det. in. dup.	Detur in duplo	Let twice as much be given.
Dext.	Dexter, Dextra	The right.
Dieb. alt.	Diebus alternis	Every other day.
Dieb. tert.	Diebus tertiis	Every third day.
Dies *vel* D.	Dies, *gen.* diei	A day.
Dig.	Digere, Digeretur	Digest, Let it be digested.
Diluc.	Diluculo	At break of day.
Dil.	Dilue, Dilutus, a, um	Dilute (thou), Diluted.
Dim.	Dimidius, a, um	One-half.
D. P. *vel* Dir. prop.	Directione propriâ	With a proper direction.
Disp.	Dispensa, Dispensetur	Dispense, Let it be dispensed.
Div. in p. æq.	Dividatur in partes æquales	Let it be divided into equal parts.
Divid.	Dividendus, a, um	To be divided.
Dol.	Dolor, Dolore	Pain, In pain.
Don.	Donec	Until.
Don. alv. dejec.	Donec alvus dejecerit	Until the bowels move.
Don. alv. sol. ft.	Donec alvus soluta fuerit	Until the bowels shall be opened.
Don. dolor neph. exulav.	Donec dolor nephriticus exulaverit	Until the nephritic pain is removed.
Don. hab. colat.	Donec habeas colaturæ	Until you have of strained liquor.
Don. len. dol.	Donec leniatur dolor	Until the pain is relieved.
Don. sint res.	Donec sint residuæ	Until there is . . . of residue.
Dos.	Dosis	A dose.
Dr., ℨ	Drachma	A drachm (60 grains).
Dulc.	Dulcis, Dulcitas	Sweet, Sweetness.
Dup.	Duplico	In duplicate.
Dur. dolor.	Durante dolore	While the pain lasts.
Ead.	Eadem (fem.)	The same.
Eburn.	Eburneus	Made of ivory.
Ejusd.	Ejusdem	Of the same.
Elect.	Electuarium	An electuary.
Em.	Emesis	Vomiting.
En., Enem.	Enema, Enemata	A clyster *or* enema, Enemas.
Epistom.	Epistomium	A stopper, bung.
Et	Et	And.
Etiam	Etiam	Also, besides.
Evan.	Evanuerit	Shall have disappeared.
Ex	Ex (*gov. ablative*)	From, out of.
Ex quib. sum.	Ex quibus sumatur	From which are given.
Ex mod. p.	Ex modo præscripto	After the manner prescribed.
Ex paul. aq.	Ex paululo aquæ	From (In) a very little water.
Ex parte	Ex parte	Partly.
Exhib.	Exhibeatur	Let it be exhibited.
Exper.	Experime	Try (thou).
[illegible]	Extende, Extendatur	Spread, Let it be spread.
p. alut.	Extende super alutem	Spread upon leather.
Extr.	Extractum, *gen.* i	An extract.

Contraction.	Word or Phrase.	English Equivalent.
Extr.	Extrahe, Extrahatur	Extract (thou), Let it be extracted.
F.	Fac	Make (thou).
F. L. A.	Fiat lege artis	Let it be made by the rules of art.
F. pil. xij	Fac pilulas duodecim	Make 12 pills.
Far.	Farina	Flour.
Fas. lint.	Fascia lintea	A linen bandage.
Fascic.	Fasciculus	A small bundle.
Febr.	Febris	Fever.
Febr. dur.	Febre durante	During the fever.
Fem. intern.	Femori interno	To the inner thigh.
Ferv.	Fervens, *gen.* entis	Hot.
Fict.	Fictilis, e	Earthen, An earthen vessel.
Fil.	Filtra	Filter (thou).
Filt.	Filtrum, *gen.* i	A filter.
Fistul. arm.	Fistula armata	A syringe ready for use.
Flav.	Flavus, a, um	Yellow.
Flor.	Flores (*pl.*)	Flowers.
Fluid. *vel* Fl.	Fluidus	Liquid.
Fol.	Folia, *gen.* orum	Leaves.
Form.	Formula, Formentur	A prescription, Let them be formed.
Frig.	Frigor, *gen.* oris	Cold.
Frust.	Frustillatim	In small pieces.
Ft.	Fiat, Fiant (*pl.*)	Let it (*or* them) be made.
Ft. cerat.	Fiat ceratum	Let a cerate be made.
Ft. chart. xij	Fiant chartulæ duodecim	Let 12 powders be made.
Ft. collyr.	Fiat collyrium	Let an eye-wash be made.
Ft. emuls.	Fiat emulsum	Let an emulsion be made.
Ft. en.	Fiat enema	Let an enema be made.
Ft. inject.	Fiat injectio	Let an injection be made.
Ft. pil. xij	Fiant pilulæ duodecim	Let 12 pills be made.
Ft. pulv.	Fiat pulvis	Let a powder be made.
Ft. pulv. xij	Fiant pulveres duodecim	Let 12 powders be made.
Ft. sol.	Fiat solutio	Let a solution be made.
Ft. suppos. viij	Fiant suppositoria octo	Let 8 suppositories be made.
Ft. troch. xx	Fiant trochisci viginti	Let 20 troches be made.
Ft. ung.	Fiat unguentum	Let an ointment be made.
Ft. venesec.	Fiat venesectio	Let a bleeding be done.
Fuerit	Fuerit	Shall have been.
Fus.	Fuscus, a, um	Brown, dark.
Garg.	Gargarisma	A gargle.
Gelat. quav.	Gelatinâ quavis	In any kind of jelly.
Ging. incid.	Gingivas incide	Lance (or cut) the gums.
Gm.	Gramma	A gramme.
gr.	Granum, Grana	A grain, Grains.
gr. vj pond.	Grana sex pondere	Six grains by weight.
Grad.	Gradatim	By degrees, gradually.
Grat.	Gratus	Pleasant.
Gros.	Grossus, a, um	Large, coarse.
Grum.	Grumus	A clot (of blood).
Gtt.	Gutta, Guttæ, Guttas	A drop, Drops.
Guttat.	Guttatim	By drops.
Gtt. quibusd.	Guttis quibusdam	With a few drops.
H.	Hora	An hour.
Har. pil.	Harum pilularum	Of these pills.
Haust.	Haustus, *gen.* i	A draught.
H. p. n.	Haustus purgans noster	My own purgative draught.
Hebdom.	Hebdomada, Hebdomas	A week.
Herb.	Herba, *gen.* æ	An herb.
Herb. recent.	Herbarum recentium	Of fresh herbs.

Contraction.	Word or Phrase.	English Equivalent.
Heri	Heri	Yesterday.
Hic, Hæc, Hoc	Hic, Hæc, Hoc	This.
Hirudo	Hirudo, *gen.* inis	A leech.
Hirud. app.	Hirudines appone	Apply leeches.
Hor.	Hora, *gen.* æ	An hour.
Hor. decub.	Horæ decubitûs	At bedtime.
Hor. j spat.	Horæ unius spatio	After one hour.
Hor. interm.	Horis intermediis	In the intermediate hours.
Hor. som.	Horâ somni	At the hour of sleep.
Hor. xj matut.	Horâ undecimâ matutinâ	At the eleventh hour of the morning.
Id.	Idem	The same.
Iden.	Identidem	Repeatedly, often.
Idon.	Idoneus, a, um	Suitable, proper, convenient.
Idon. vehic.	Idoneo vehiculo	In a suitable vehicle.
Ill.	Illico	Then, immediately.
Immit.	Immitatur	Let it be placed in.
Imp.	Impone	Lay on, apply.
Impr.	Imprimis	First, chiefly.
In	In	In, within, upon, not.
Inc.	Incide, Incisus	Cut (thou), Being cut.
Ind.	In dies	Daily, *or* From day to day.
Inde	Inde	Therefrom.
Infun.	Infunde	Pour in.
Infus.	Infusum	An infusion.
Ing.	Ingere, Ingerendus	Put into, Putting into.
Injec.	Injectio	An injection.
Injic. enem.	Injiciatur enema	Let a clyster be injected.
In lag. bene obt.	In lagena bene obturator	In a well-stoppered bottle.
In loco frig.	In loco frigido	In a cold place.
In mass. cog.	In massam cogantur	Let them be combined in a mass.
In pulm.	In pulmento	In gruel.
Instar	Instar	As big as, the size of.
Int.	Internus, a, um	Inner, internal, between.
Inter	Inter	Between.
Intus	Intus	Inwardly.
Invol. gelat.	Involve gelatina	Coat (*or* cover) with gelatin.
Invor.	Invoruntur	Let them be moistened.
Ita	Ita	In such manner.
Iter.	Iteretur, Iterentur	Let it (them) be repeated.
Jam	Jam	Now.
Jentac.	Jentaculum, *gen.* i	Breakfast.
Jucund.	Jucunde	Pleasantly.
Jul.	Julepum	A julep.
Juscel.	Juscellum	A broth.
Juscul.	Jusculum	Soup.
Jux.	Juxta, Juxtim	Near to, Close by.
K.	Kali, Kalium	Potassa, Potassium.
Kal. ppt.	Kali præparata	Potassium carbonate.
Lac.	Lac, *gen.* Lactis	Milk, Of milk.
Lag.	Lagena, *gen.* æ	A flask, *or* bottle.
Lam.	Lamella	Plate, leaf, layer, scale.
Lan.	Lana, *gen.* æ	Flannel, wool.
Lang.	Languor, *gen.* oris	Faintness.
Lapid.	Lapideus, a, um	Stony, made of stone.
Larg.	Largus, a, um	Abundant, plentiful.
Larid.	Laridum, *gen.* i	Lard.
[illegible]	Latus, a, um	Broad, wide.
[illegible]	Latus, *gen.* eris	The side.
[illegible]ov.	Latere admoveatur	Let it be applied to the side.

Contraction.	Word or Phrase.	English Equivalent.
Lat. dol.	Lateri dolenti	To the painful side.
Lax.	Laxus, a, um	Loose, open.
Lb., ℔	Libra	A pound.
Lect.	Lectus, *gen.* i	A bed.
Len.	Leniter	Easily, gently.
Len. ter.	Leniter terendo	By rubbing gently.
Lev.	Leviter	Lightly.
Lig.	Ligatura	A ligature.
Linct.	Linctus, *gen.* i	A linctus, (taken by licking).
Linim.	Linimentum, *gen.* i	A liniment.
Lint.	Linteum, *gen.* i	Lint, linen.
Liq.	Liquor, *gen.* oris	A solution.
Lot.	Lotio	A lotion.
Lut.	Luteus, a, um	Yellow, golden yellow.
M., ♏	Minimum, *gen.* i	A minim.
M.	Misce	Mix (thou).
M.	Manipulus, *gen.* i	A handful.
Macer.	Macera	Macerate (thou).
Mag.	Magnus, a, um	Large.
Man.	Manipulus, *gen.* i	A handful.
Mane	Mane (indecl.)	Morning, in the morning.
Mane primo	Mane primo	Early in the morning.
Manus	Manus, *gen.* i	The hand.
Mass.	Massa, *gen.* æ	A mass, a pill-mass.
Mat.	Matula, *gen.* æ	A vessel, a chamber-pot.
Matut.	Matutinus	In the morning.
Med.	Medius, a, um	Middle.
Mens.	Mensura	By measure.
Mic. pan.	Mica panis	A crumb of bread.
Min.	Minimum	A minim.
Minut.	Minutum *	A minute.
Mis.	Misce, Misceatur	Mix (thou), Let it be mixed.
Mis. bene	Misce bene	Mix well.
Mis. caut.	Misce caute	Mix cautiously.
Mist.	Mistura	A mixture.
Mit.	Mitte, Mittatur, Mittantur	Send (thou), Let it be sent, Let them be sent.
Mit. sang. ad uncias xij salt.	Mitte sanguinem ad uncias duodecim saltem	Take away blood to 12 ounces at least.
Mit. tal.	Mitte tales	Send of such.
Mod. dict.	Modo dictu	As directed.
Mod. pr.	Modo præscripto	In the manner prescribed.
Modic.	Modicus, a, um	Moderate-sized, middling.
Mol.	Mollis, Molle	Soft.
Mor.	Mora, *gen.* æ	Delay.
Mor. dict.	More dictu	In the manner directed.
Mor. sol.	More solito	In the usual manner.
Mort.	Mortarium, *gen.* i	A mortar.
Natr.	Natrium, *gen.* i	Sodium.
Ne tr. s. num.	Ne trades sine nummo	Do not deliver without the money.
Necn.	Necnon	And also, and yet.
Nig.	Niger, nigra, nigrum	Black.
Nisi	Nisi	Unless.
No.	Numero, Numerus	In number, A number.
Noct.	Noctis	Of the night.
Noct. maneq.	Nocte maneque	At night and in the morning.
Non	Non	Not.

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* This is medical Latin, or "bog-Latin." The proper Latin for a minute of time is *Sexagesima pars horæ*.

Contraction.	Word or Phrase.	English Equivalent.
Non repetat.	Non repetatur	Let it not be repeated.
Noxa	Noxa, *gen.* æ	An injury.
Nucha	Nucha	The nape of the neck.
Nunc	Nunc	Now.
Nut.	Nutricius, a, um	Nutritious.
Nutrit.	Nutritus, *gen.* ûs	Nutriment.
Nux	Nux, *gen.* nucis	A nut.
Nux mosch.	Nux moschata	A nutmeg.
O.	Octarius	A pint (℥xvj).
Obd.	Obduce	Cover, conceal, coat.
Obduct.	Obductus, a, um	Covered, coated.
Obtrit.	Obtritus, a, um	Crushed.
Occlus.	Occlusus, a, um	Enclosed.
Oct.	Octo, Octavus	Eight, Eighth.
Octup.	Octuplus	Eight-fold.
Ocul.	Oculus, *gen.* i	The eye.
Odor.	Odora, Odoretur	Perfume, Let it be perfumed.
Odorat.	Odoratus, a, um	Perfumed, odorous.
Ol. lini sine ig.	Oleum lini sine igne	Cold-drawn linseed oil.
Ol. O. Opt.	Oleum olivæ optimum	Best olive oil.
Olla	Olla, *gen.* æ	A pot, a jar.
Ollic.	Ollicula, *gen.* æ	A little pot.
Omn. hor.	Omni horâ	Every hour.
Omn. bih.	Omni bihorio	Every two hours.
Omn. quadr. hor.	Omni quadrante horæ	Every ¼ hour.
Omn. mane	Omni mane	Every morning.
Omn. noct.	Omni nocte	Every night.
Op.	Opus	Need, occasion.
Opt.	Optimus, a, um	Best.
Oryza	Oryza, *gen.* æ	Rice.
Os	Os, *gen.* oris	The mouth.
Ov.	Ovum, *gen.* ovi	An egg.
P.	Pondere	By weight.
P. P. A.	Phiala prius agitata	The bottle having been first shaken.
P. r. n.	Pro re nata	Occasionally, as needed.
Pab.	Pabulum, *gen.* i	Food.
Pallid.	Pallidus, a, um	Pale.
Pan.	Panis, Pannus	Bread, A cloth *or* rag.
Par., Pt.	Pars, *gen.* Partis	A part, Of a part.
Para, Parat.	Para, Paratus	Prepare, Prepared.
Pt. æq.	Partes æquales	Equal parts.
Pt. affect.	Parte affecta	On the affected part.
Part. vic.	Partitis vicibus	In divided doses.
Parv.	Parvus, a, um	Little.
Parvul.	Parvulus, a, um	An infant, a parvule.
Pastil.	Pastillus, Pastillum	A pastille, a lozenge.
Pauc.	Paucus, a, um	Little, few.
Paul.	Paulatim	Little by little, gradually.
Pect.	Pectus, *gen.* oris	The breast.
Pediluv.	Pediluvium	A foot-bath.
Penicil. cam.	Penicillum camelinum	A camel's-hair pencil or brush.
Per	Per (*prep. gov. accus.*)	Through, by means of, very.
Peract. operat. emet.	Peractâ operatio emetici	When the emesis is finished.
Percalef.	Percalefactus, a, um	Thoroughly heated.
Percol.	Percola	Strain through, percolate.
Per deliq.	Per deliquium	By deliquescence.
Per fistul. vit.	Per fistulam vitream	Through a glass tube.
Perg.	Perge, Pergetur	Proceed, Let be continued.
Perind.	Perinde	Just as.

Contraction.	Word or Phrase.	English Equivalent.
Permit. vir.	Permittentibus viribus	The strength permitting.
Perpur.	Perpurus, a, um	Very clean.
Pervesp.	Pervesperi	Very late in the evening.
Pes	Pes, *gen.* pedis	The foot.
Pess.	Pessarium, Pessulum	A pessary.
Ph.	Phiala, *gen.* æ	A vial, a bottle.
Pil.	Pilula, *gen.* æ	A pill.
Pil.	Pilus, *gen.* i	The hair.
Ping.	Pinguis, *gen.* is	Fat, grease.
Pist.	Pistillum, *gen.* i	A pestle.
Plac.	Placebo	I will satisfy (please).
Plas.	Plasma, Plasmetur	Mould, Let it be moulded.
Plen.	Plenus, a, um	Filled.
Poc.	Poculum, Pocillum	A cup, A little cup.
Pon., P.	Pondere	By weight.
Pon. civ.	Pondus civile	Civil weight (avoirdupois).
Pon. med.	Pondus medicinale	Medicinal (apothecaries') weight.
Pone aur.	Pone aurem	Behind the ear.
Post cib.	Post cibos	After meals.
Post sing. sed. liq.	Post singulas sedes liquidas	After every loose stool.
Postrid.	Postridie	On the next day.
Pot.	Potus, *gen.* ûs	A drink.
Præ	Præ (*prep. gov. abl.*)	Before, very.
Præp.	Præparatus, a, um	Prepared.
Prand.	Prandium, *gen.* i	Dinner.
Prid.	Pridie	On the previous day.
Prim. man.	Primo mane	Very early in the morning.
Primus	Primus, a, um	The first.
Pro	Pro (*adv. and prep. gov. abl.*)	For, before, according to.
Prop.	Proprius, a, um	Special, particular.
Pro rat. æt.	Pro ratione ætatis	According to the age of the patient.
Pro r. n.	Pro re nata	Occasionally, as needed.
Prox.	Proximo	Nearest.
Pug.	Pugillus	A pinch.
Pulm.	Pulmentum, *gen.* i	Gruel.
Pulv.	Pulvis, *gen.* eris	A powder.
Pulv. gros.	Pulvis grossus	A coarse powder.
Pulv. subtil.	Pulvis subtilis	A smooth powder.
Pulv. ten.	Pulvis tenuis	A fine powder.
Pulvz.	Pulverizatus, a, um	Powdered.
Pur.	Purus, a, um	Pure, clean.
Purg.	Purgativus, *gen.* i	A purgative, a purging.
Pyx.	Pyxis, *gen.* idis	A small box, a pill-box.
Q.	Quadrans, *gen.* tis	A fourth part, a quart.
Q. lib.	Quantum libet	As much as you please.
Q. p.	Quantum placet	" " " " "
Q. q.	Quoque	Also.
Qq.	Quisque, Quaque	Each, *or* Every.
Qq. hor.	Quâquâ horâ	Every hour.
Q. s.	Quantum sufficiat	As much as is sufficient.
Q. s.	Quantum satis	" " " " "
Q. v.	Quantum vis	As much as you please.
Q. vol.	Quantum volueris	" " " " "
Quad.	Quadruplo	Quadruple, in fourfold.
Quam	Quam	As much as.
Quart.	Quartus, *gen.* i	Fourth.
Quat., Quater	Quatuor, Quater	Four, Four times.
Quibus	Quibus	From which.

Contraction.	Word or Phrase.	English Equivalent.
Quinq.	Quinque	Five.
Quint.	Quintus	The fifth.
Quoq.	Quoque	Also.
Quor.	Quorum	Of which.
Quotid.	Quotidie	Daily.
Quoties req.	Quoties requiritur	As often as is required.
℞	Recipe	Take (thou).
Rar.	Rarus, a, um	Loose, thin, rare.
Rat.	Ratio, *gen.* onis	Relation, proportion.
Rec.	Recens, *gen.* entis	Fresh, recent, newly.
Red. in pulv.	Redactus in pulverem	Reduced to powder.
Redig. in pulv.	Redigatur in pulverem	Let it be reduced to powder.
Reg. umbil.	Regio umbilici	The umbilical region.
Rel.	Relectus, a, um	Opened, loosened.
Reliq.	Reliquus, *gen.* i	Remaining, the remainder.
Renov.	Renova, Renovetur	Renew, Let it be renewed.
Renov. semel	Renovetur semel	Let it be renewed once only.
Rept.	Repetatur, Repetantur	Let it (them) be repeated.
Res	Res, *gen.* rei	A substance, thing, affair.
Resid.	Residuus, a, um	Residual, remaining.
Respon.	Responde	Answer (thou).
Retin.	Retinetur	Let it be withheld.
Rict.	Rictus, *gen.* ûs	A wide (distended) opening.
Rig.	Rigidus, a, um	Rigid, hard, inflexible.
Rub.	Ruber, Rubra, Rubrum	Red, ruddy.
Rudic.	Rudicula, *gen.* æ	A spatula.
Rudis	Rudis, *gen.* is	A stirring-rod.
Rum.	Rumen, *gen.* inis	The throat.
S. expr.	Sine expressione	Without expression.
S. A.	Secundum artem	According to art.
S. L.	Secundum legem	According to law.
S. N.	Secundum naturam	According to nature.
S. S. S.	Stratum superstratum	Layer upon layer.
S. V. R.	Spiritus vini rectificatus	Alcohol.
S. V. T.	Spiritus vini tenuis	Proof spirit.
Sac. lac.	Saccharum lactis	Sugar of milk.
Sac. sat.	Saccharum saturni	Sugar of lead.
Sæp.	Sæpe	Frequently.
Sal	Sal, *gen.* salis	Salt.
Sal am.	Sal amarum	Magnesium sulphate.
Sal mir.	Sal mirabile	Sodium sulphate.
Sal vol.	Sal volatile	Ammonium carbonate.
Saltem	Saltem	At least.
Saltim	Saltim	By leaps.
Sang.	Sanguis, Sanguineus	Blood, Bloody.
Sap.	Sapor, *gen.* oris	A flavor, delicacy.
Sat.	Satis	Enough, sufficient.
Saturat.	Saturatus, a, um	Saturated.
Scarif.	Scarifica	Scarify (thou).
Scarif. expl.	Scarificatione explicata	Scarification having been effected.
Scat.	Scatula, *gen.* æ	A box.
Scil.	Scilicet	Namely.
Scrup., ℈	Scrupulum, *gen.* i	A scruple (20 grains).
Scut. pect.	Scuto pectori	For protection to the breast.
Sec.	Secundo, Secundum	Secondly, According to.
Secund.	Secundus	Second.
Sed.	Sedes, *gen.* is	The fundament, the feces.
Semel	Semel	Once.
Semidr.	Semi-drachma	Half a drachm.

Contraction.	Word or Phrase.	English Equivalent.
Semih.	Semi-hora	Half an hour.
Sensim	Sensim	Gently, gradually, slowly.
Separ.	Separatim	Separately.
Sept.	Septem	Seven.
Septim.	Septimana	A week.
Sero	Sero	Late, at a late hour.
Sesq.	Sesqui	One and a half.
Sesqh.	Sesquihora	An hour and a half.
Sesunc.	Sesuncia	An ounce and a half.
Sev.	Sevum, *gen.* i	Suet, tallow.
Sex, Sext.	Sex, Sextus	Six, Sixth.
Si	Si	If.
Sic!	Sic!	So, thus.
Sic.	Sicca, Siccetur	Dry (thou), Let it be dried.
Sic.	Siccus	Dry, Dried.
Sig.	Signa, Signetur	Write (thou), Let it be marked.
Sig. nom. prop.	Signatur nomine proprio	Let it be written upon (marked) with its proper name.
Sign.	Signanter	Clearly, distinctly.
Sile hujus!	Sile hujus!	Keep silence concerning this.
Simp.	Simplex, *gen.* simplicis	Simple, unmixed.
Simul	Simul	Together.
Sin.	Sine	Without.
Sing.	Singulorum	Of each.
Si non val.	Si non valeat	If it does not answer.
Si op. sit	Si opus sit	If necessary.
Si vir. perm.	Si vires permittebant	If the strength will permit.
Sit	Sit	Let it be.
Sit in promp.	Sit in promptu	Let it be in readiness.
Sitis, Siti	Sitis, Siti	Thirst, For thirst.
Sol.	Solus	Alone, only.
Solat.	Solatium, *gen.* ii	A soothing, assuaging.
Solit.	Solitus, a, um	Accustomed, ordinary.
Solut.	Solutus, a, um	Dissolved.
Solut.	Solutio, *gen.* onis	A solution.
Solv.	Solve, Solvetur	Dissolve, Let it be dissolved.
Solv. c. calor.	Solve cum calore	Dissolve with heat.
Som.	Somnus, *gen.* i	Sleep.
Spiss.	Spissus, a, um	Dense, hard.
Spt.	Spiritus, *gen.* ûs	Spirit.
Spt. vin. rect.	Spiritus vini rectificatus	Rectified spirit of wine (Alcohol).
Spt. vin. ten.	Spiritus vini tenuis	Proof spirit.
Spt. vinos.	Spiritus vinosus	Ardent spirit (of any strength).
ss.	Semis, Semissis, Semi-	A half.
St.	Stet, Stent	Let it (or them) stand.
Stat.	Statim	Immediately.
Stib.	Stibium, *gen.* ii	Antimony.
Stillat.	Stillatim	By drops, drop by drop.
Stom.	Stomachus, *gen.* i	The stomach.
Strat.	Stratum, *gen.* i	Layer, stratum.
Strat. superst.	Stratum, superstratum	Layer upon layer.
Suav.	Suavis	Pleasant, agreeable.
Sub	Sub	Under, somewhat.
Subact.	Subactus	Subdued, sinking.
Sub fin. coct.	Sub finem coctionis	When the boiling is nearly done.
Subind.	Subinde	Frequently.
Subtil.	Subtilis	Fine, smooth, nice.
Suc.	Succus, *gen.* i	Juice, sap.
Suggil.	Sugillationi	To the bruise.

Contraction.	Word or Phrase.	English Equivalent.
Sum.	Sume, Sumat	Take (thou), Let him take.
Sum.	Sumatur, Sumantur	Let it (them) be taken.
Sum. tal.	Sumat talem	Let him take one like this.
Sumend.	Sumendus	To be taken.
Summit.	Summitates	The highest points, summits.
Sum. mane sum.	Summo mane sumendus	To be taken very early in the morning.
Summ.	Summus, a, um	Highest, summit.
Sup.	Super, Supra	Above, upon, over.
Sup. bib. haust.	Superbibendo haustum	Drinking afterwards this draught.
Suppos.	Suppositoria, *gen.* æ	A suppository.
Suppos. rect.	Suppositoriæ rectales	Rectal suppositories.
Suppos. ureth.	Suppositoriæ urethrales	Urethral suppositories.
Syr.	Syrupus, *gen.* i	Syrup.
T. d., *vel* T. i. d.	Ter die, *vel* Ter in die	Thrice daily.
Tab.	Tabella, *gen.* æ	A lozenge, tablet.
Tal.	Talis, *gen.* is	Of such, like this.
Tam	Tam	So far, in so far.
Tan.	Tandem	At last, finally.
Tant.	Tantum, *gen.* i	So much, so many.
Teg.	Tegmen, *gen.* inis	A cover.
Temp.	Tempus, *gen.* oris	Time, temple.
Temp. dext.	Tempori dextro	To the right temple.
Ten.	Tenuis	Fine, weak, thin.
Tep.	Tepidus, a, um	Tepid, lukewarm.
Ter	Ter	Thrice, three times.
Tere, Teret.	Tere, Teretur	Rub (thou), Let it be rubbed.
Tere sim.	Tere simul	Rub (thou) together.
Teres	Teres, *gen.* etis	Rubbed, smooth, polished.
Tert.	Tertius	Third.
Test. ov.	Testa ovi	An egg-shell.
Thion.	Thionas, *gen.* atis	Sulphur, sulphate.
Tinct., *vel* Tr.	Tinctura, *gen.* æ	Tincture.
Tinct. herb. recent.	Tincturæ herbarum recentium	Tinctures of fresh herbs.
Tinct. theb.	Tinctura thebaica	Laudanum.
Tr.	Tres, Tria	Three.
Trid.	Triduum, *gen.* ui	The space of three days.
Trit.	Tritura, Trituretur	Triturate, Let it be triturated.
Troch.	Trochiscus, Trochisci	A lozenge, *or* troche, Lozenges.
Tum	Tum	Then, next, furthermore.
Turb.	Turbidus, a, um	Turbid, muddy.
Tus.	Tussis, *gen.* is	A cough.
Tuto	Tuto	Safely.
Ubi	Ubi	Where, wherever, whenever.
Uln.	Ulna, *gen.* æ	The arm, elbow.
Ult.	Ultime, Ultima	Lastly, at the last.
Ult. præsc.	Ultimo præscriptus	The last ordered.
Una	Una	Together.
Unc., ℥	Uncia, *gen.* æ	An ounce.
Unct.	Unctus, a, um	Anointed, besmeared.
Unctul.	Unctulus, a, um	" "
Ung.	Unguentum, *gen.* i	An ointment, unguent.
Unguil.	Unguilla, *gen.* æ	An ointment-box.
Urg.	Urgens, *gen.* entis	Pressing, urgent.
Ust.	Ustus, a, um	Burnt.
Ut	Ut, Uti	That, so that, in order that.
Ut dict.	Ut dictum	As directed.
[illegible]nd. more sol.	Utendus more solito	To be used in the usual manner.
[illegible]	Utere	Use (thou), make use of.

Contraction.	Word or Phrase.	English Equivalent.
Vas	Vas, *gen.* vasis	A vessel, utensil, bottle.
Vas vit.	Vas vitreum	A glass vessel.
Vehic.	Vehiculum, *gen.* i	A vehicle, menstruum.
Vel	Vel (*or* Ve *as a suffix*)	Or.
Venæsec. brach.	Venæsectio brachii	Bleeding in the arm.
Venen.	Venenum, Venenosus	A poison, Poisonous.
Ver.	Verus, a, um	True, real, genuine.
Vesp.	Vesper, *gen.* eris	The evening.
Vesper.	Vesperma, *gen.* æ	Supper.
Vic.	Vicis, Vices	Change, changes.
Vin.	Vinum, *gen.* i	Wine.
Vir.	Vires (*pl.* of Vis)	Strength, vigor, life.
Virid.	Viridis, Viride	Green.
Vis	Vis, *gen.* viris	Strength, vigor, life.
Vitel.	Vitellus, *gen.* i	Yolk.
Vitel. ovi	Vitellus ovi	Yolk of egg.
Vitel. ovi sol.	Vitello ovi solutus	Dissolved in the yolk of an egg.
Vitr.	Vitrum, Vitreus	Glass, Of glass, glazed.
Vol.	Volatilis, Volatile	Volatile.
Vom. urg.	Vomitione urgente	Vomiting being severe.

For Dangerous Abbreviations, see *ante*, page 546, under the title PRESCRIPTIONS.

NUMERALS.

CARDINALS.		ORDINALS.	
Unus	One.	Primus	First.
Duo	Two.	Secundus	Second.
Tres	Three.	Tertius	Third.
Quatuor	Four.	Quartus	Fourth.
Quinque	Five.	Quintus	Fifth.
Sex	Six.	Sextus	Sixth.
Septem	Seven.	Septimus	Seventh.
Octo	Eight.	Octavus	Eighth.
Novem	Nine.	Nonus	Ninth.
Decem	Ten.	Decimus	Tenth.
Undecim	Eleven.	Undecimus	Eleventh.
Duodecim	Twelve.	Duodecimus	Twelfth.
Tredecim	Thirteen.	Tertius decimus	Thirteenth.
Quatuordecim	Fourteen.	Quartus decimus	Fourteenth.
Quindecim	Fifteen.	Quintus decimus	Fifteenth.
Sexdecim	Sixteen.	Sextus decimus	Sixteenth.
Septemdecim	Seventeen.	Septimus decimus	Seventeenth.
Octodecim	Eighteen.	Octavus decimus	Eighteenth.
Novemdecim	Nineteen.	Nonus decimus	Nineteenth.
Viginti	Twenty.	Vicesimus	Twentieth.
Viginti unus, *vel* Unus et viginti	Twenty-one.	Vicesimus primus	Twenty-first.
		Vicesimus secundus	Twenty-second.
Triginta	Thirty.	Tricesimus	Thirtieth.
Quadraginta	Forty.	Quadragesimus	Fortieth.
Quinquaginta	Fifty.	Quinquagesimus	Fiftieth.
Sexaginta	Sixty.	Sexagesimus	Sixtieth.
Septuaginta	Seventy.	Septuagesimus	Seventieth.
Octoginta	Eighty.	Octogesimus	Eightieth.
Nonaginta	Ninety.	Nonagesimus	Ninetieth.
Centum	One hundred.	Centesimus.	Hundredth.

GENITIVE CASE-ENDINGS.

NOM.	GEN.	EXCEPTIONS.
a	æ	Cataplasma, Enema, Physostigma, Aspidosperma and Gargarisma, all have the genitive in *-atis*. Coca is unchanged, though the genitive Cocæ is written by some authorities. Folia is plural, gen. Foliorum.
us um os on	i	Rhus, Rhois; Flos, Floris; Bos, Bovis; Limon, Limonis; Erigeron, -ontis. Fructus, Cornus, Quercus, Spiritus, Haustus Potus, do not change, being of the 4th declension.
as	atis	Asclepias, -adis; Mas, Maris.
is	idis	Pulvis, -eris; Arsenis, -itis; Phosphis, -itis; Sulphis, -itis, and all salts ending in -is, have the genitive in -itis.
o	onis	Mucilago, -inis; Ustilago, -inis; Solidago, -inis.
l	lis	Fel, Fellis; Mell, Mellis; Sumbul, Sumbuli.
en ps rs r x	inis pis rtis ris cis	*Words which do not change in the Genitive.* *Amyl. Azedarach. Berberis. Buchu. Cannabis. Catechu. *Coca. Condurango. Cornus. Curare. Digitalis. Fructus. Haustus. Hydrastis. Jaborandi. Kino. Matico. Potus. Quercus. Sago. Sassafras. Sinapis. Spiritus. * But some authorities give Amylis, Cocæ.

PRONUNCIATION.

Attention is particularly directed to the accentuation of words commonly mispronounced; as, for example, acètas, ángina, átropa, chimáphila (*kimaphila*), chlòridum, codèia, conìum, énema, iódidum, radìcis, rìcinus, sinàpis, syrùpus, éczema, umbìlicus, abdómen, brómidum, páresis.

VERBS.

The Verbs used in prescription writing are nearly all in the imperative mood, giving directions to the compounder, and having their objects in the accusative case. Such are—

Adde, add.
Cola, strain.
Divide, divide.
Extende, spread.
Fac, make .
Filtra, filter.
Macera, macerate.
Misce, mix.
Recipe, take.
Signa, write.
Solve, dissolve.
Tere, rub.

A few verbs are found in the subjunctive mood, taking their subject or predicate in the nominative case. The most usual are—

Fiat, let be made.
Coletur, let be strained.
Coloretur, let be colored.
Bulliat, let boil.
Capiat, let take.
Detur, let be given.
Dividatur, let be divided.
Sit, let it be.
Sumatur, let be taken.

PARTICIPLES.

Participles or Verbal Adjectives are occasionally used, and should agree with their respective nouns in gender, number, and case. Such are—

Adhibendus, a, um, to be administered.
Dividendus, a, um, to be divided.
Sumendus, a, um, to be taken.

PREPOSITIONS.

Those in the first column require the noun following to be in the accusative case,—those in the second column require the ablative case.

Ad, to, up to.
In, into.
Supra, upon.

Cum, with.
Pro. for.
Sine, without.

Ana, of each,—governs the genitive case.

SUNDRY WORDS AND PHRASES, IN MOST FREQUENT USE.

Bene, well.
Bis, twice.
Dein, thereupon.
Et, and.
Gradatim, gradually.
Guttatim, by drops.
In dies, daily.
Da, give.

Non, not.
Numerus, number.
Octarius, a pint.
Semel, once.
Simul, together.
Statim, at once.
Ter, thrice.
Quater, four times.

Ad saturandum, to saturation.
Numero, to the number of.
Quantum sufficiat, as much as necessary.
Pro re natâ, according to need.
In partes æquales, into equal parts.
Redactus in pulverem, let be pulverized.
Secundum artem, according to art.
Non repetatur, let it not be repeated.

HYPODERMIC FORMULÆ.

Apomorphine.

℞. Apomorphinæ Hydrochlor., gr. j.
Div. in pulv. xvj. One to four in ♏xx of water as required.

Atropine.

℞. Atropinæ Sulphatis, . . . gr. j.
Aquæ Destillatæ, ... ℥j.
Solve. Sig.—For hypodermic use, ♏vj = gr. $\frac{1}{80}$, ♏iv = gr. $\frac{1}{120}$.

Caffeine.

℞. Caffeinæ Citratis, ... gr. xxiv.
Aquæ Destillatæ, ... ℥j.
Solve. Sig.—♏xx contain gr. j.

Carbolic Acid.

℞. Ac. Carbol. Purif., . . . gr. x.
Aquæ Destil., ... ℥j.
M. Sig.—♏viij contain gr. ⅙ of the acid, which may be given up to gr. ij or iij.

Chloral.

℞. Chloralis Hydratis, . . . ʒiv.
Aquæ Destil., ... ℥j.
M. Sig.—♏xxx contain gr. xv of Chloral Hydrate.

Chloroform.

℞. Chloroformi Purif., . . . ℥ss.
Sig.—♏v–xv can be used as one deep injection. (See page 264.) The spirit is safer, in somewhat larger doses.

Coniine.

℞. Coniinæ Hydrobromat., . gr. j.
Aquæ Destillat., ... ℥j.
M. Sig.—♏x contain gr. $\frac{1}{48}$.

Cocaine.

℞. Cocainæ Hydrochlorat., . gr. v.
Aquæ Destillatæ, ... ʒij.
Solve. Sig.—♏xij contain gr. ss.

Curare.

℞. Curare (Merck), ... gr. j.
Acidi Acetici, ... ♏v.
Aquæ Destillatæ, q. s. *ad* ♏c.
M. et filtra. Sig.—♏x contain gr. $\frac{1}{10}$.

℞. Curarinæ Sulphat., . . . gr. j.
Aquæ Destillat., . . . ℥ss.
M. Sig.—♏iv contain gr. $\frac{1}{60}$.

Daturine.

℞. Daturinæ, ... gr. ss.
Aquæ Destil., ... ℥j.
Solve. Sig.—♏iv contain gr. $\frac{1}{240}$.
Dose, ♏iv–x.

Digitalin.

℞. Digitalini, ... gr. ss.
Alcoholis,
Aquæ Destil., ... aa ʒij.
Solve. Sig.—♏ix contain gr. $\frac{1}{120}$.
Dose, ♏iv–viij.

Duboisine.

℞. Duboisinæ Sulphat., . . . gr. j.
Aquæ Destil., ... ℥j.
M. Sig.—♏iv contain gr. $\frac{1}{200}$.

Ergot and Ergotin.

℞. Extr. Ergotæ Fluid., . . . ℥ss.
Filtra. Sig.—Dose, ♏x.

℞. Extracti Ergotæ (Squibb), ʒj.
Aquæ Destillat., ... ℥j.
Solve et filtra. Sig.—♏x contain gr. j. Dose, ♏x–xx.

Hyoscine, Hyoscyamine.

℞. Hyoscinæ Hydrobrom., *vel*
Hyoscyaminæ Hydrobrom., gr. j.
Aquæ Destillatæ, ... ℥j.
M. Sig.—♏v contain gr. $\frac{1}{96}$.

Mercury.

℞. Hydrarg. Chlor. Corr., . gr. j.
Aquæ Destillat., ... ℥j.
M. Sig.—♏x contain gr. $\frac{1}{48}$.

℞. Hydrarg. Chlor. Corrosivi,
Ammonii Chloridi, . . āā gr. iij.
Misce et solve in—
Aquæ Destillatæ, ... ʒjss.
Dein adde—
Albuminis Ovi, ... ʒjss.
Aquæ Destillatæ, ... ʒv.
Filtra, et adde—
Aquæ Destil., . . q. s. *ad* ʒx.
Sig.—♏j contains gr. $\frac{1}{200}$. Dose, ♏iij–x.

℞. Hydrarg. et Sodii Iodidi, . gr. iij.
Aquæ Destillatæ, ... ʒiijss.
Solve. Sig.—♏x contain gr. ¼. Dose, ♏x every second day.

Morphine.

℞. Morphinæ Sulphatis, . . . gr. xvj.
Acidi Carbolici, ... ♏iij.
Aquæ Destillat., ... ℥j.
Solve et filtra. Sig.—♏vijss contain gr. ¼. (*Antiseptic Magendie's Solution.*)

Morphine and Atropine.

℞. Morphinæ Sulphatis, . . . gr. xvj.
Atropinæ Sulphatis, . . . gr. ss.
Acidi Carbolici, ... ♏iij.
Aquæ Destillat., ... ℥j.
et filtra. Sig.—♏vijss contain gr.
rphine Sulph., and gr. $\frac{1}{200}$ of
lphate.

℞. Morphinæ Sulphatis, . . . gr. xxiv.
Atropinæ Sulphatis, . . . gr. j.
Ol. Amygdalæ Amar., . . gtt. j.
Aquæ Destillat., ... ℥ij.
Solve. Sig.—♏x contain gr. ¼ of Morphine Sulphate, and gr. $\frac{1}{96}$ of Atropine Sulphate. (*Didama's Solution.*)

Physostigmine (Eserine).

℞. Physostigminæ Sulph., . . gr. j.
Aquæ Destillatæ, ... ℥j.
Solve. Sig.—♏viij contain gr. $\frac{1}{60}$.

Pilocarpine.

℞. Pilocarpinæ Hydrochlor., . gr. xvj.
Aquæ Destillat., ... ℥j.
M. Sig.—♏v contain gr. ⅙.

Potassium Iodide.

℞. Potassii Iodidi, ... ʒj.
Aquæ Destillatæ, ... ʒiv.
Solve. Sig.—Dose, ♏vj–xx.

Quinine.

℞. Quininæ Disulph., . . . gr. l (50).
Ac. Sulphurici Dil., . . ♏c (100).
Ac. Carbolici, ... ♏v (5).
Aquæ Destillatæ, . . . ℥j.
Solve. Sig.—ʒj contains gr. vj. (*Lente.*)
Is irritant (B).

℞. Quininæ Hydrobrom., . . gr. xlviij.
Aquæ Destillat., ... ʒiv.
Solve. Sig.—♏xx contain gr. iv.

℞. Quininæ Bimur. Carbamidat.,
Aquæ Destillatæ, . . . āā ʒiv.
Solve. Sig.—♏x contain gr. v.

Strychnine.

℞. Strychninæ Sulphat., . . . gr. j.
Aquæ Destillatæ, ... ℥j.
Solve sine alcohol. Sig.—♏x contain gr. $\frac{1}{48}$.

℞. Strychninæ Nitratis, . . . gr. iij.
Aquæ Fervid., ... ʒx.
Solve. Sig.—♏x contain gr. $\frac{1}{20}$.
(*Portugaloff.*)

PATENT MEDICINES.

These formulæ have been published from time to time in various journals and formularies, and are supposed to represent the preparations designated. The name of the author is appended in each case when known.

Alcoholic Strength of Quack Bitters.

Hostetter,	43.20
Drake Plantation,	30.24
Rush,	34.20
Peruvian,	22.40
Hoofland,	20.85
Oxygenated,	19.23
California Wine Bitters,	18.20
Walker's Vinegar Bitters,	7.20

Amick's Consumption Cure.

The Amick advertisements appeared shortly after the publication of Dr. N. B. Shade's paper in this and other journals. Amick copied Shade's language, speaking of the "chemical" cure, etc., and, I believe, adopted Shade's methods of treatment. These were fully described by Shade, and consist in the use of Calomel, Iodoform, Guaiacol, etc.

(*Dr. Waugh, in Times and Register.*)

Ayer's Ague Cure.

This, according to Churchill's analysis, is alleged to consist of a syrupy tincture of Peruvian Bark with Aromatics, each bottle holding six fluid ounces, and each fluid ounce containing 3.2 grains of amorphous Cinchona alkaloids, 3 grains Cinchonine, 0.7 grain Cinchonidine, 0.8 grain Quinine, and one grain of Quinidine.

Ayer's Cherry Pectoral.

Morphinæ Acetat.,	gr. iij.
Vini Antim. et Potass. Tartrat.,	
Vini Ipecacuanhæ,	āā ʒiij.
Tinct. Sanguinariæ,	ʒij.
Syr. Pruni Virginian.,	℥iij.

Ayer's Pills.

Consist of Colocynth, Gamboge and Aloes, coated with Starch and Sugar.

Ayer's Sarsaparilla.

Alcohol,	
Fl. Extr. of Sarsaparilla,	
Fl. Extr. of Stillingia,	āā ℥iij.
Fl. Extr. of Yellow Dock,	
Fl. Extr. of Podophyllum,	āā ℥ij.
Sugar,	℥j.
Potassium Iodide,	ʒjss.
Iodide of Iron,	gr. x.

Mix.

Brandreth's Pills.

Podophylli Radicis,	gr. x.
Extracti Podophylli,	gr. x.
Extr. Phytolaccæ Baccæ,	gr. xxx.
Pulv. Caryophylli,	gr. x.
Cambogiæ,	gr. ij–v.
Ol. Menthæ Piperitæ,	♏iij.
Croci,	gr. ij.

Misce, fiat massa, et div. in pil. xxiv.

(*Hager.*)

Castoria.

Senna,	av. oz. 2.
Pumpkin seed,	dr. 6.
Rochelle salts,	dr. 4.
Wormseed, Levant,	dr. 3.
Sodium Bicarbonate,	dr. 2.
Anise Seed,	dr. 1.
Oil of Gaultheria,	dr. ½.
Oil of Peppermint,	dr. ⅛.
Sugar,	av. oz. 8.
Water, enough to make	fl. oz. 16.

Exhaust the vegetable drugs by boiling with water, evaporate to the proper volume, and dissolve the sugar and other ingredients.

(*Western Druggist.*)

Chlorodyne, Collis Browne's.

Morphine Hydrochlorate,	gr. 6.
Chloroform,	dr. 6.
Cannabis Indica,	gr. 6.
Prussic Acid (Scheele's),	♏ 6.
Treacle, to make,	oz. 1.

Dose.—10 to 30 minims. (*Hygiene.*)

Clarke's Blood Mixture.

Potassium Iodide,	gr. 48.
Chloric Ether,	dr. 4.
Liquor Potassæ,	♏ 30.
Water, colored with Burnt Sugar,	oz. 7½.

Dose.—One tablespoonful four times a day. (*Hygiene.*)

Ely's Cream Balm

consists of Vaselin, 1 ounce; Thymol, 3 grains; Bismuth Carb., 15 grains; Oil Wintergreen, 2 minims. The directions are to dip the little finger into the balm and insert up the nostrils, giving two or three full inhalations. (*Medical Record.*)

Garfield Tea

consists chiefly of Senna leaves and Couch-grass (Triticum), with aromatics. (*Prof. Lengfield.*)

Hamburg Tea.

Sennæ Foliorum,	pt. viij.
Mannæ,	pt. iv.
Coriandri,	pt. j.

Hamlin's Wizard Oil.

Spt. Camphoræ,	℥j.
Spt. Ammoniæ,	
Olei Sassafras,	aa ℥ss.
Olei Caryophylli,	ʒij.
Chloroformi,	
Olei Terebinthinæ,	aa ℥ss.
Alcoholis,	q. s. *ad* ℥v.

Helmbold's Buchu.

Said to resemble the genuine.

Short Buchu,	oz. 9.
Uva Ursi,	oz. 4½.
Liquorice root,	dr. 10.

Macerate in 9 pints of boiling water, strain and add—

Caramel,	oz. 2.
Molasses,	oz. 8.

Mix well and add—

Cubeb (fl[illegible]	oz. 5.
Alc[illegible]	[illegible]ts 2.

Holloway's Ointment.

Has in 159 parts—

Olive Oil,	62½ par
Lard,	50 "
Resin,	25 "
White Wax,	12½ "
Yellow Wax,	3 "
Turpentine,	3 "
Spermaceti,	3 "

Holloway's Pills.

Have in 144 pills—

Aloes,	gr. 62.
Rhubarb,	gr. 27.
Saffron,	gr. 3.
Glauber's Salt,	gr. 3.
Pepper,	gr. 7.

(*Dorva*

Hostetter's Bitters.

Sacchari Albi,	
Aurantii Corticis,	
Calami,	
Cinchonæ,	
Gentianæ,	aa ℔j.
Rhei Pulv.,	℥iv.
Cinnamomi,	℥ij.
Caryophylli,	℥j.
Alcoholis Diluti,	Cij.

(*Med. Bulletin*, 188

The Keeley Gold Cure.

The hypodermic injection, administe 4 times daily for 3 weeks, contains Stryc nine (or Brucine) and Atropine (or Hy cine), with Codeine and Cocaine for t opium cases. The whiskey supplied to t victims contains about gr. $\frac{1}{16}$ of Apomo phine to each average drink. The "cru shot" is an injection of Apomorphine. Th "tonic" contains—

Ammonium Chloride,	gr. j.
Aloin,	gr. ij.
Tinct. Cinchonæ Comp.,	℥iij.
Water, to make,	℥iv.

(*N. Y. Med. Record.*)

Laville's Gout Mixture.

Calcium Chloride, Chinoidin, of each,	grm. 5.
Extract of Colocynth,	grm. 25.
Water,	grm. 85.
Alcohol,	grm. 100.
Spanish Wine,	grm. 800.

Made into a solution. A pill of very complicated composition is used in connection with the gout remedy. (*Hager.*)

[See also page 285, *ante.*]

Morrison's Pills.

Powdered Colocynth, . . . gr. 3.
Powdered Gamboge, . . . gr. 6.
Powdered Aloes, ... gr. 9.
Cream of Tartar, ... gr. 12.

Also syrup enough for 12 pills. Serious results are often produced by large doses of these pills.

Orange Blossom.

Zinc Sulphate, ... gr. 60.
Alum, ... gr. 15.
Expr. Oil of Almond, . . gr. 90.
Extract of Hyoscyamus, . gr. 1.
White Wax, ... gr. 30.
Oil of Theobroma, ... gr. 180.

Made into oblong suppositories, one inch long, one and a half wide and half an inch thick, weighing 32 grains each.

Perry Davis's Pain Killer.

Tinct. Capsici, ... ℥j.
Spt. Camphoræ, ... ℥ij.
Guaiaci Resinæ, ... ℥ss.
Alcoholis, ... ℥iij.
Tinct. Myrrhæ, q. s. ut coloretur.

Pierce's Favorite Prescription.

Sabinæ, Cinchonæ,
Agarici Albi, ... aa ʒij.
Cinnamomi, ... gr. xv.
Coq. in aq. suff. et ft. decoct. ℥viij.
Deinde cola, et adde—
Sacchari Albi, ... ℥ss.
Acaciæ, ... ʒj.
Solve, et addantur—
Tinct. Opii Deodorat.,
Tinct. Digitalis, . . . aa ʒss.
Ol. Anisi, gtt. viij, in Alcoholis, ... ℥jss.
Misce. (*Hager.*)

Pierce's Golden Discovery.

Ext. Lactuci, ... ʒj.
Mellis, ... ℥j.
Tinct. Opii Deodorat., . . ʒss.
Alcoholis Diluti,
Aquæ, ... aa ℥iij.
(*Hager.*)

Radam's "Microbe-Killer."

Oil of Vitriol (impure), . . dr. 4.
Muriatic Acid (impure), . dr. 1.
Red Wine, ... oz. 1.
Water, ... gall. 1.
(*Eckels.*)

Radway's Ready Relief.

Tinct. Capsici,
Aquæ Ammoniæ,
Alcoholis, ... aa ℥j.
Linimenti Saponis, ... ℥iij.
(*Hager.*)

Radway's Resolvent.

Vini Zingiberis,
Vini Cardamomi, . . . aa ℥iij.
Sacchari Albi, ... q. s.
(*Hager.*)

Recamier Balm.

Zinc Oxide, ... ℔s. 5.
Glycerin, ... dr. 2.
Alcohol, ... oz. 2.
Mercuric Chloride, ... oz. 4.
Distilled Water, ... qts. 64.
(*Boston Herald.*)

Recamier Cream.

Rice Flour, ... oz. 48.
Zinc Oxide, ... oz. 60.
Glycerin, ... oz. 640.
Cacao Butter, ... oz. 48.
Lard, ... oz. 48.
Mercuric Chloride, ... oz. 4.
Make 32 pints. (*Boston Herald.*)

Revalenta Arabica Food.

Consists solely of Lentils ground up into a fine powder. (*Stokes in "Hygiene."*)

Sage's Catarrh Remedy.

Salis Culinaris(Sodii Chlor.),partes xx.
Pulv. Camphoræ, ... part. j.
Acidi Carbolici, ... part. j.

M.—To be dissolved in water and either injected or sniffed up the nose.

Pulv. Hydrastis Canadensis, partes v.
Pulv. Indigo, ... part. ss.
Pulv. Camphoræ,
Acidi Carbolici, ... aa partes ij.
Sodii Chloridi, ... partes l.
(*New Remedies.*)

Sanford's Catarrh Cure.

According to an analysis made by Prof. A. B. Lyons for the *New Idea*, this preparation is composed of distilled extract of Witch-hazel, containing a little Alcohol and Glycerin and some Morphine. The proportions of the constituents were not determined. (*Nat. Druggist.*)

Seigel's (Mother) Syrup.

Contains Aloes, gr. 30 to the oz. Also Borax, Capsicum, Liquorice, and Treacle. (*Stokes in "Hygiene."*)

Sequah's Oil.

A mixture of ⅔ Turpentine and ⅓ Fish Oil, scented with a few drops of Oil of Camphor. (*Stokes in "Hygiene."*)

Sequah's Prairie Flower.

Has to the ounce—

Aloes, ... gr. 52½.
Carbonate of Soda, . . . gr. 17½.
Water, ... gr. 362½.

and a few drops of the Tinctures of Capsicum and Myrrh. (*Stokes in "Hygiene."*)

St. Jacob's Oil.

Gum Camphor,
Chloral Hydrate,
Chloroform,
Sulphuric Ether, . of each, oz. 1.
Tinct. of Opium,
Oil of Origanum,
Oil of Sassafras, . of each, oz. ½.
Alcohol, ... gal. ½.

Dissolve the Gum Camphor in the Oils and Alcohol, then add the other ingredients.

Squibb says that it is a weak Aconite Liniment, also containing Ether, Alcohol, Turpentines, red coloring matter, and water. (*Ephemeris*, p. 114.)

Swift's Specific, "S.S.S."

Fluid Extr. of Smilax Sarsaparilla, 16 parts.
Fluid Extr. of Stillingia Sylvatica, 16 parts.
Fluid Extr. of Lappa Minor, . . 16 parts.
Fluid Extr. of Phytolacca, . . . 16 parts.
Tinct. of Xanthoxylum, ... 8 parts.
(*Registered Pharmacist.*)

Stearns' *New Idea* gives the following: Stillingia, Pokeroot, and Sarsaparilla, with Nitrate of Potash and a small quantity of Iron, and enough Alcohol to preserve it.

Tamar Indien.

According to the *Report de Pharmacie*, the formula for this preparation is as follows:—

Tamarind (pulp), 450; powd. Sugar, 40; powd. Sugar-of-milk, 60; pure Glycerin, 50 (all parts). Mix and evaporate to the consistence of a soft extract, then add powd. Anise, 10; Ess. Lemon, 3; Tartaric Acid, 3 (all parts). Mix and divide into 100 boluses. Roll in the following mixture: Cream of Tartar, 5; White Sugar, 35; Sugar-of-milk, 35; Tragacanth, 2; [illegible] owd. Red Sandal, 25 [illegible] up in tin foil. ([illegible] rican *Druggist.*)

Thompson's Eye-Wate

Copper Sulphate, ... g
Zinc Sulphate, ... g
Rose-water, ... p
Tincture of Saffron, . . . d
Tincture of Camphor, . . d

Mix and filter.

Van Buskirk's Sozodont

Saponis Albi, ... ℥
Alcoholis, ... ℥
Aquæ, ... ℥
Glycerini, ... ℥
Olei Gaultheriæ,
Olei Caryophylli,
Olei Menthæ Piperitæ,
āā q. s. *ad* sapore
Cocci Cacti, q. s. ut coloretur.

Calcis Præcipitat.,
Magnesii Carbonatis,
Iridis Florent. Radicis, . āā p.

M. et triturat. (*Hoff*

Vita Nuova.

Cocaine, ... gr
Pepsin (golden scale), . . gr
Port Wine, ... ga
(*Boston F*

Walker's Vegetable Vinegar I

Aloes Socotrin, ... ℥
Guaiaci Resinæ, ... ℥
Sassafras Mucil., ... ℥
Aceti, ... ℥
Aquæ, ... q.

Coque, et ft. decoctum, ad ℥ xi
deinde cola, et addantur—

Sodii Sulphatis, ... ℥
Acaciæ, ... ℥
Spt. Anisi, 10 p. c., . . . ℥
Alcoholis, ... ℥

M. Dose, ʒ ij. (*Eber*

Warner's Safe Kidney and Liver

In Germany each maker of patent cines must furnish the government the formula for the patent he makes is the one furnished by Warner for " Kidney and Liver Cure." Each b contains:—

Extr. Lycopus Virginiana, . gr. 30
Extr. Hepatica (herb), . . gr. 3
Extr. Gaultheria, ... gr. 7½
Potassium Nitrate, ... gr. 3
Alcohol (90%), ... oz. 1½
Glycerin, ... dr. 10
Water sufficient to make one pint.
(*Formulary and Druggists' Ma*)

TABLES OF DIFFERENTIAL DIAGNOSIS.

Forms of Bright's Disease.

Compared with Acute Nephritis and with each other.

Clinical Phenomena		Acute Nephritis.	(1) Acute Bright's Disease. Acute Parenchy. Nephritis.	Chronic Bright's Disease.			
				(2) Chron. Parenchy. Nephritis. (*Large White Kidney.*)	(3) Fatty Kidney.	(4) Amyloid or Waxy Kidney.	(5) Chron. Interstitial Nephritis. (*Cirrhotic Kidney.*)
Urine.	*Quantity*, . . .	Normal or —	—	— or +	Normal or —	Normal or +	Normal or +
	Reaction, . . .	Acid.	Acid.	Acid.	Acid.	Acid.	Acid.
	Color, ...	Wine yellow.	Dark smoky.	Brown yellow.	Pale.	Pale.	Clear.
	Sp. Gr., ...	Normal or —	High.	—	1.015–1.030	—, above 1.010	— 1.010
	Urea, ...	Normal.	—	—	—	Normal or —	Normal.
	Chlorides, . . .	Normal.	—	—	—	—	Normal.
	Albumin (*per cent.*), ...	$\frac{1}{10}$ to $\frac{1}{8}$	1 to 6	½ to 2	1 to 6	$\frac{1}{10}$ to ½ of globulin.	$\frac{1}{10}$ to ⅕
	Casts, ...	Hyaline and Epithel.	Blood Epithel. Hyaline.	Granular Hyaline. No blood.	Fatty.	Few and Hyaline.	Very few.
	Sediment (*macroscopical*),	Mucus. Blood.	Brown cells. Urates.	Kidney epithelium. Blood. Lymph.	Free oil.	Seldom any.	Seldom any.
Dropsy, ...		Seldom.	Great, especially of face.	Never absent.	Great.	Trifling.	In last stages.
Uremia, ...		. . .	Often great.	Not marked.	Rare.	Rare.	Great.
Other Symptoms,		Still joints. Sacral pain. Lassitude.	Fever.	Temperature low. No fever. Inflam. of serous membr's Cardiac hyper.	Face pale, puffy. Cardiac hyper.	Emaciation, sallow face, enlarged liver and spleen, thirst, diarrhea.	Retinitis. Tense, quick pulse. Hyper. of heart.
Prognosis, ...		Favorable.	Recovery or No. 2.	Recovery (?) or No. 3.	Always fatal.	Depends on constitutional disease present.	Unfavorable, but course perhaps long.

Note.—The signs + and — in the line entitled *Sp. Gr.*, respectively denote a specific gravity greater than 1.024, or less than 1.018.

Cancer.

Cancerous (Malignant) Tumors.	*Non-malignant Tumors.*
Are of constitutional origin.	Origin, some local error of growth.
Have no cyst, but invade and convert the surrounding tissues.	Limited by a cyst; may compress, but do not invade adjacent tissues.
Cancer material is short-lived from rapid deterioration, but is rapidly reproduced.	Have uncertain period of increase, after which may remain stationary.
Severe increasing pain.	Usually no pain.
Extend to remote parts, reappearing chiefly in lymphatic glands.	Are local, have no disposition to spread.
Cancerous cachexia of general health.	Impair functions of part pressed on.
Recur after extirpation, fatal in end.	Do not recur.

Scirrhus.	*Encephaloma.*
Is hard.	Is soft and brain-like.
Appears mostly on female breast.	Most frequently on the limbs.
Hard kernel, movable under skin.	At first deeply seated, hard to recognize.
Becomes fixed to adjoining structures, which it puckers.	Spreads through loose textures, which it pushes aside and distends.
Single and grows slowly.	Has numerous tumors, grows rapidly.
Course slow—2 to 4 years.	Generally fatal in 1 to 2 years.
Never in the young.	Often in the young, even at birth.

Carditis, Endo- and Peri-.

Endocarditis.	*Pericarditis.*
Blowing sound. Excited heart action.	Friction sound. Excited heart action.
Slight if any increase of percussion dullness.	Marked increase in effusion stage.
Impulse strong.	Wavy and feeble.
Sounds normal or more distinct except at site, where a murmur is heard.	Feeble and muffled; no blowing sounds.

Cerebral.

Concussion.	*Compression.*
Patient can be roused; pupils react.	Complete insensibility; motionless pupils.
Breathing seldom stertorous.	Breathing usually stertorous.
Urinary action normal.	May be either retention or incontinence.
Symptoms appear soon after accident.	Frequently do not.

Chancre and Chancroid.

Chancre.	*Chancroid.*
Commences about 3d week after coitus.	In 24 hours to 3 days.
First as a papule, abrasion, or crack.	First as a red spot, then a pustule, then a suppurating sore.
Generally indurated (rarely not).	Not on an indurated base.
Develops slowly.	Develops rapidly.
Discharge slight, unless irritated.	Suppurates profusely.
Is soon limited and seldom phagedenic.	Tends to invade surrounding tissues, or become phagedenic.
Edges sloping, not undermined.	Edges undermined.
Scanty serous secretion.	Discharge is purulent and copious.
Sore remains solitary, and cannot be multiplied.	May be transplanted at will, and is seldom single.
Followed by numerous buboes, rarely suppurating, never furnish inoculable pus.	A single bubo may appear and suppurate.

Cholera.

Asiatic.	*Simple.*
Preceded by painless diarrhea.	Seizure sudden.
Not directly from error in diet.	Generally is from error in diet.
First pain shooting down thighs.	First pain is abdominal (colic).
Prostration rapid and overwhelming, and out of ratio to evacuations.	Prostration gradual, less marked than the vomiting and purging.
Rapid reduction of surface temperature; high temperature in cavities.	Gradual reduction of surface temperature; internal temperature normal.
Evacuations like rice-water from the first.	Discharges bilious, causing burning and smarting pain; colorless only at very last.
Cramps commence in extremities.	Cramps commence in abdomen.
Veins congested; tongue, lips and extremities livid purple.	Not so.
Urine albuminous.	Not so.

Croup and Diphtheria.

Croup.	*Diphtheria.*
Premonitory hoarse, metallic cough, without illness.	Premonitory illness, marked by chills, fever and sore throat, without cough.
A child's disease.	Attacks adults as well.
Tenacious mucus covering the swollen membrane.	Distinguished by a false membrane, and the *Klebs-Loeffler bacillus.*
A local disease.	A blood poison; great general depression.

Epilepsy and Hysteria.

Epilepsy.	*Hysteria.*
Loss of consciousness is sudden, complete.	Gradual and partial or apparent.
Livid face, frothy saliva escapes, eyelids half open, eyeballs rolling, teeth grinding, tongue biting; more or less insensibility of pupils to light.	Face flushed, or complexion unaltered, no froth on lips, eyelids closed, eyeballs fixed, no grinding of teeth, or biting of tongue; pupils react readily.
Countenance is distorted.	Is not.
Patient shows no feeling.	Sighs, or laughs, or sobs.
Aura epileptica may precede attack.	Globus hystericus.
Short paroxysm, followed by heavy comatose sleep and dull intellect.	Longer paroxysm; patient not sleepy, usually wakeful and depressed in spirits.
Frequently occurs at night.	Rarely occurs at night.
Not necessarily of uterine connection, though a paroxysm often occurs at the menstrual period.	Often connected with uterine or menstrual disorders.

Gout and Rheumatism.

Gout.	*Rheumatism.*
Affects chiefly the small joints, especially the metatarsal joint of the great toe.	Large joints chiefly implicated.
Occurs from 35–50 years of age; rarely before puberty.	Occurs generally in young adults.
Most frequent in men, and often the result of idle, intemperate and luxurious life.	Affects both sexes equally, and equally the poor and the rich.
Is strongly hereditary.	But slightly so.
Chalk-stones (sodium urate) in external ear, on tips of fingers, or elsewhere.	Not so.
Uric Acid in the blood, absent from urine.	Lactic Acid in the blood.
A fit often affords temporary relief.	Quite the contrary.
Bronchitis common.	Not so.
Is confined to the temperate zone.	Is ubiquitous—prevails in all climates.

Pleurisy and Pneumonia.

Pleurisy.	*Pneumonia.*
Sharp pain, friction sound, dry cough, impaired chest motion.	Dull pain, crepitant râle, cough followed by expectoration.
In stage of effusion, obliteration of intercostal spaces, enlargement of the side, viscera displaced.	In stage of hepatization none of these signs are present.
Dullness, with enfeebled or absent respiration, voice, and fremitus.	Dullness, with marked bronchial respiration, distinct thoracic voice, increased vocal fremitus.
Sputa frothy, rarely any râles.	Sputa rusty color, râles common.
Febrile symptoms slight usually.	Febrile symptoms severe.
Temperature irregular, rarely high.	Sudden elevations and falls, high temperature not uncommon.

Scarlet Fever, Measles and Smallpox.

Scarlet Fever.	*Measles.*	*Smallpox.*
Incubation, 1 day to weeks.	Incubation, 7 to 14 days.	Incubation, 6 to 20 days, average, 10.
Fever, great heat of skin, and frequent pulse, unabated during eruption.	Same fever rather increased by eruption.	Fever often violent, bounding pulse, pain in loins; all are greatly relieved by eruption.
Brilliant stare.	Liquid, watery eye.	Eyes injected, face red.
Sore throat, rarely coryza or bronchitis.	Coryza and bronchitis very constant, sore throat rarely.	Sore throat often, also a dry cough.
"Raspberry" tongue, red.	Tongue coated, may be red at edges.	Tongue coated, and swollen, may be red at edges.
Temperature may be 105°–106° to 10th day, subsides gradually, falls on 5th, 10th, and 15th days.	103°–106° before eruption, remains high for 1 to 2 days thereafter, then falls suddenly.	Before eruption often 106°, then rapidly sinks to 100° in 36 hours; rises during the secondary fever.
No secondary fever.	No secondary fever.	Secondary fever always.
Eruption on second day, not rough, first on neck and chest, spreads rapidly, white streak on pressure with nail.	Eruption on fourth day, on face, rough, spreads gradually, the streak lasts only a short time.	Eruption usually on third day, at first on lips, forehead and hands, spreads rapidly.
Eruption uniform, or in large patches, interspersed raised spots and some vesicles; rash scarlet, on its seventh day very complete desquamation in large patches.	Eruption in crescentic patches, lasts about 5 days, then partial desquamation, scales very fine.	Eruption is first papular, then vesicular, finally pustular; pustules maturate on 8th day of eruption.
Cerebral symptoms are frequent and grave.	Not so.	Cerebral symptoms are frequently seen.
Pneumonia rare, pleurisy more frequent.	Pneumonia a frequent complication.	Pneumonia not a very frequent complication.
Sequelæ: Bright's disease, dropsy, deafness, conjunctivitis, phthisis, chronic diarrhea; glandular enlargements.	Sequelæ: chronic bronchitis, phthisis, conjunctivitis.	Sequelæ: chronic diarrhea, glandular enlargements, various eye diseases.

Typhus and Typhoid.

Typhus Fever.	*Typhoid (Enteric) Fever.*
Attacks quickly, incubation 9 days.	Commences slowly, incubation about 13 days.
Occurs at any age.	Most common in youth and childhood, rare after the age of 40.
Rare among the higher classes, except those exposed.	As common among the rich as the poor.
Mulberry Eruption on 4th and 5th day, on extremities, lasts until the close.	Rose Eruption on 7th to 10th day, isolated, flattened papules, few, on abdomen and back, in successive crops which fade and disappear.
Brain chiefly affected; bowels often but little so; abdomen natural, evacuations dark, but never bloody (these are occasionally reversed).	Bowels chiefly affected, evacuations ochre-color and watery, sometimes hemorrhage or even ulceration, abdomen tumid.
Contracted pupils, dusky face.	Dilated pupils, cheeks flushed.
Pulse and temperature rise to 120 and 105° until 3d day, high for 6 days, then fall.	Pulse and temperature rise and fall independently, and without uniformity, but both are usually high to the 15th day.
Lasts 2 to 3 weeks.	Lasts 4 to 6 or more weeks.
Relapses rare.	Relapses frequent.
Death from coma or congestion of the lungs, in 1st or 2d week.	Death from asthenia, pneumonia, hemorrhage or perforation of intestine, in or after 3d week.
Arises from destitution, over-crowding, bad ventilation, is highly contagious and generally epidemic. No microbe determined.	From poisoned drinking water, putrid animal matter, bad drainage; is not contagious, often sporadic. *Eberth's bacillus* present in the intestinal lesions, the spleen, liver, blood, etc.
Post-mortem: changes not constant, the most frequent are dark blood, enlarged spleen, soft heart.	Post-mortem: morbid Peyer's patches, enlarged mesenteric glands, ulcerated mucous coat of intestines; enlarged and soft spleen, ulcerated pharynx.

Vomiting.

Cerebral.	*Gastric or Hepatic.*
Little or no nausea, vomiting continues after stomach is emptied.	Nausea relieved by vomiting, returns when food is taken.
No tenderness on pressure over the liver or stomach.	Liver and stomach are tender, pressure produces inclination to vomit.
Pulse infrequent and hard.	Pulse frequent and weak.
Tongue clean, breath sweet, conjunctivæ normal or injected, headache primary.	Tongue furred, breath offensive, conjunctivæ often yellowish, headache secondary as to time.
Constipation generally obstinate.	Griping abdominal pain, diarrhea and clay-colored stools.
No salivation.	Increased salivation.

Yellow and Bilious Remittent Fevers.

Yellow Fever.	*Bilious Remittent.*
Duration short, ends in 3 to 7 days.	Lasts 9 days or more.
Incubation 5 to 9 days.	Incubation may extend to months.
A disease of one paroxysm, terminating in recovery or collapse.	A disease of several paroxysms, with intervening remissions.

Yellow Fever.	*Bilious Remittent.*
Very severe nausea and vomiting, early epigastric tenderness.	These symptoms are not so severe, nor do they occur so early.
Black vomit, due to gastric hemorrhage.	Bilious vomiting.
Hemorrhages from various parts.	No hemorrhagic tendency.
Tongue clean, or slightly coated.	Tongue heavily coated.
Pulse variable, slow at end.	Pulse quick until convalescence.
Eye injected and humid.	Eye natural.
Supra-orbital pain, pain in back and in calves of legs.	Headache, sense of fullness in head, often no loin or leg pains.
Rarely delirious, mind clear generally.	Delirium frequent, mind dull.
Urine albuminous, usually suppressed.	Not so.
Convalescence rapid, no sequelæ.	Convalescence slow, tedious sequelæ.
Muscular prostration slight.	Muscular prostration greater.
Mortality high, disease epidemic.	Mortality slight, disease endemic.
Treatment unsatisfactory.	Very amenable to treatment.
Autopsy: inflamed or congested stomach, enlarged yellow liver, filled with oil globules, muscular fibres of heart are often disintegrated.	Autopsy: stomach congested, rarely inflamed, liver olive or bronze hue, not fatty.

TABLE OF SPECIFIC GRAVITIES AND SPECIFIC VOLUMES.

(Temperature at 59° F., except when otherwise stated. Where the sp. gr. is variable, the mean specific gravity is stated.)

Liquid.	Specific Gravity.	Specific Volume.	Liquid.	Specific Gravity.	Specific Volume.
Acid, Acetic, ...	1.048	.954	Liq. Ferri Tersulph., .	1.320	.757
Acid, Acetic, Dil., . . .	1.008	.992	Liq. Potassæ, ...	1.036	.965
Acid, Hydrobromic (34 per cent.), ...	1.303	.767	Liq. Sodæ, ...	1.059	.944
Ac. Hydrobrom. Dil., . .	1.077	.928	Mel (Honey), ...	1.375	.727
Ac. Hydrochloric, . . .	1.163	.860	Oleum Adipis, ...	.915	1.092
Ac. Hydrochlor. Dil., . .	1.059	.952	Ol. Amyg. Expres., . .	.917	1.091
Acid, Lactic, ...	1.213	.824	Ol. Aurant. Cort., . .	.850	1.176
Acid, Nitric, ...	1.414	.709	Ol. Bergamottæ, . . .	.883	1.132
Acid, Nitric, Dil., ...	1.057	.946	Ol. Caryophylli, . . .	1.065	.939
Acid, Oleic, ...	.900	1.111	Ol. Copaibæ, ...	.900	1.111
Acid, Phosphoric, . . .	1.710	.584	Ol. Cubebæ, ...	.920	1.086
Acid, Phosphoric, Dil., .	1.057	.946	Ol. Eucalypti, ...	.920	1.086
Acid, Sulphuric, ...	1.835	.545	Ol. Gaultheriæ, ...	1.180	.848
Ac. Sulphuric, Dil., . . .	1.070	.934	Ol. Gossyp. Sem., . .	.925	1.081
Æther, ...	.725	1.379	Ol. Lavandulæ, ...	.886	1.128
Alcohol, at 60° F., . . .	.820	1.219	Ol. Limonis, ...	.858	1.165
Alcohol, at 77° F., . . .	.812	1.231	Ol. Lini, ...	.936	1.068
Alcohol, Dil., at 60° F., .	.937	1.066	Ol. Menthæ Pip., . . .	.910	1.098
Alcohol, Dil., at 77° F., .	.930	1.075	Ol. Morrhuæ, ...	.923	1.083
Aqua Destil., at 59° F., .	1.000	1.000	Ol. Olivæ, ...	.916	1.092
Aq. Ammoniæ, ...	.960	1.042	Ol. Ricini, ...	.960	1.042
Aq. Ammon. Fort., . . .	.901	1.109	Ol. Rosmarini, ...	.905	1.104
Benzin, ...	.670	1.493	Ol. Sassafras, ...	1.080	.925
Carbon Disulphide, . .	1.268	.788	Ol. Sesami, ...	.921	1.294
Chloroform, ...	1.490	.671	Ol. Terebinthinæ, . .	.862	1.160
Chloroformum Venale, .	1.470	.680	Spt. Ætheris Nitrosi, .	.839	1.192
Glycerin, ...	1.250	.800	Spt. Frumenti, ...	.920	1.086
Liq. Ferri Acet., ...	1.160	.862	Spt. Vini Gallici, . . .	.933	1.071
Liq. Ferri Chlor., ...	1.387	.721	Syrupus, ...	1.317	.759
			Vinum Album, ...	1.000	1.000

CHLORODYNE.

A Comparison of Ten Formulæ therefor, the Quantities being calculated for each to a Four-Ounce Mixture, or ♏ 1920.

Articles.		Quantity of each article in a ℥iv mixture, as per the formula of									
		Squire, P.*	Smith, Edw.†	Chandler.‡	U. S. Disp.	Nat'l Disp.	P. D. & Co.**	Whitla.¶	Bartholow.	Brit. Phar.††	Collis Browne.§
Morphine Hydrochlorate, . . .	gr.	1	16	16	32	33½	14	16	$1\frac{1}{30}$	4	24
Chloroform, . . .	♏	236	192	240	372	375	207	240	247	240	240
Ether, ...	♏	59	96	. .	. .	. .	. .	120	62	60	. .
Cannabis Indica, Tincture, . . .	♏	. .	. .	. .	248	250	207	20	. .	. .	. .
Cannabis Indica, Extract, . . .	gr.	. .	. .	32	. .	. .	. .	. .	. .	. .	24
Hydrocyanic Acid, 2 p. c., .	♏	118	192	. .	50	50	42	90	123	120	48
Ol. Menthæ Piperitæ, ...	♏	2	6	16	10	8	7	7	2	2	
Capsicum, Fluid Extract, . . .	♏	. .	. .	4	. .	. .	. .	. .	. .	. .	. .
Capsicum, Tincture, ...	♏	. .	290	. .	. .	37	7	120	.	. .	. .
Capsicum, Oleoresin, ...	♏	. .	. .	. .	4	. .	. .	. .	. .	. .	. .
Alcohol, ...	♏	236	. .	810	904	1010	690	. .	247	240	. .
Hydrochloric Acid, ...	♏	. .	. .	. .	126	62	. .	30	. .	. .	. .
Sugar, Burnt, . .	gr.	. .	. .	. .	. .	. .	. .	20	. .	. .	. .
Glycyrrhiza, Extract, ...	gr.	147	. .	. .	. .	. .	. .	. .	154	240	. .
Acacia, Mixture, .	♏	. .	384	. .	. .	. .	. .	. .	. .	. .	. .
Tragacanth, Mucilage, . . .	♏	. .	. .	. .	. .	. .	. .	903	. .	. .	. .
Theriaca, *or* Syr. Fusci, ...	♏	236	760	. .	. .	. .	. .	150	247	240	1632
Syrup, ...	♏	. .	760	. .	. .	. .	. .	. .	992	q. s.	. .
Glycerin, ...	♏	1033	. .	818	. .	. .	760	. .	. .	. .	. .
Water, ...	♏	. .	. .	. .	126	128	. .	240	. .	. .	. .
Morphine Hydrochlor. in ♏xv, .	gr.	$\frac{1}{128}$	⅛	⅛	¼	¼	$\frac{1}{10}$	⅛	$\frac{1}{128}$	$\frac{1}{32}$	$\frac{1}{5}$

NOTE.—See *ante*, page 261, for remarks on this preparation, and the number of formulæ representing it.

* Author of "A Companion to the Br. Pharmacopœia."

† See Hartshorne's "Essentials," 5th ed., p. 625.

‡ Made by Eli Lilly & Co., Indianapolis.

¶ 2d ed., page 430.

** Parke, Davis & Co., Detroit.

†† Tinct. Chloroformi et Morphinæ, B. P.

§ As given by Stokes and Blyth in "Hygiene."

TABLE SHOWING THE NUMBER OF DROPS IN A FLUIDRACHM

OF VARIOUS LIQUIDS, ALSO THE WEIGHT OF ONE FLUIDRACHM IN GRAINS.

(COMPARE PAGE 535.)

Liquid.	Drops in fʒj. (♏lx.)	Weight of fʒj in grains.	Liquid.	Drops in fʒj. (♏lx.)	Weight of fʒj in grains.
Acetum Opii, ...	90	61	Liq. Iodi Compos., . . .	63	59
Acetum Scillæ, ...	68	57	Liq. Potassæ, ...	62	58
Acid, Acetic, ...	108	58	Liq. Zinci Chloridi, . .	89	88
Ac. Acetic, Dil., ...	68	55	Oleores. Aspidii, ...	130	52
Acid, Carbolic, ...	111	59	Oleores. Capsici, ...	120	51
Ac. Hydrochloric, . . .	70	65	Oleores. Cubebæ, . . .	123	52
Ac. Hydrocyanic, . . .	60	54	Oleum Anisi, ...	119	54
Acid, Lactic, ...	111	66	Oleum Bergamottæ, . .	130	46
Acid, Nitric, ...	102	77	Oleum Cari, ...	132	50
Ac. Nitro-hydrochloric,	76	66	Oleum Juniperi, ...	148	49
Ac. Phosphoric Dil., . .	59	57	Oleum Limonis, ...	129	47
Ac. Sulphuric, ...	128	101	Oleum Ricini, ...	77	51½
Ac. Sulph. Aromat., . .	146	53	Oleum Rosæ, ...	132	47
Ac. Sulph. Dil., ...	60	58½	Oleum Terebinthinæ, .	136	45½
Ac. Sulphurosum, . . .	59	55	Oleum Tiglii, ...	104	50
Æther, ...	176	39	Spt. Ætheris Comp., . .	148	45
Alcohol, ...	146	44	Spt. Ætheris Nitrosi, .	146	47
Aqua, ...	60	55	Spt. Camphoræ, ...	143	47
Aqua Destillata, ...	60	53½	Syrupus, ...	65	72
Balsam of Peru, ...	101	60	Syrupus Acaciæ, . . .	44	73
Bromine, ...	250	165	Syrupus Ferri Iodidi, .	65	77
Chloroform, ...	250	80	Syrupus Scillæ, ...	75	74
Copaiba, ...	110	51	Syr. Scillæ Comp., . . .	102	70
Creosote, ...	122	56½	Syrupus Senegæ, . . .	106	70
Ext. Belladon. Fl., . .	156	57	Tinctura Aconiti, . . .	146	46
Ext. Buchu Fl., ...	150	47½	Tinct. Belladonnæ, . .	137	58
Ext. Digitalis Fl., . . .	134	62	Tinct. Benzoini Comp., .	148	48
Ext. Ergotæ Fl., . . .	133	60	Tinct. Cantharidis, . .	131	51
Ext. Ipecac. Fl., ...	120	60	Tinct. Digitalis, ...	128	53
Ext. Rhei Fl., ...	158	61	Tinct. Ferri Chlor., . .	150	53
Ext. Senegæ Fl., . . .	137	62	Tinct. Iodi, ...	148	47
Ext. Valerianæ Fl., . .	150	49	Tinct. Opii, ...	130	53
Ext. Zingib. Fl., ...	142	48	Tinct. Opii Camph., . .	130	52
Glycerin, ...	67	68	Tinct. Opii Deodor., . .	110	54
Hydrargyrum, ...	150	760	Vin. Colchici Rad., . .	107	55
Liq. Acidi Arsenosi, . .	57	55	Vin. Colchici Sem., . .	111	54
Liq. Ferri Chloridi, . .	71	72	Vinum Opii, ...	100	55

WEIGHTS AND MEASURES.

APOTHECARIES' OR TROY WEIGHT.

Pound. Ounces. Drachms. Scruples. Grains.

℔ ℥ ʒ ℈ gr.
1 = 12 = 96 = 288 = 5760
1 = 8 = 24 = 480
1 = 3 = 60
1 = 20

METRIC WEIGHTS.

1 Milligramme, . . . 0.001 = gr. $\frac{1}{64}$
1 Centigramme, . . . 0.01 = gr. $\frac{1}{6}$
1 Decigramme, . . . 0.1 = gr. $1\frac{1}{2}$
Gramme, ... 1. = gr. 15.432
Kilogramme, . . . 1000. = ℔ 2.7 Troy. / ℔ 2.2 Av.

APOTHECARIES' OR WINE MEASURE.

Gallon. Pints. Fl' ounces. Fl' dr'ms. Minims.

C. O. f℥ fʒ ♏
1 = 8 = 128 = 1024 = 61440
1 = 16 = 128 = 7680
1 = 8 = 480
1 = 60

APPROXIMATE EQUIVALENTS.

♏j or gr. j, ... = .06 gramme.
fʒj or ʒj, ... = 4. grammes.
f℥j, ... = 30. "
℥j, ... = 31. "
f℥j of Glycerin, ... = 37. "
f℥j of Syrups, ... = 40. "

TABLE FOR CONVERTING APOTHECARIES' WEIGHTS AND MEASURES INTO METRIC.

(ADAPTED FROM MAISCH.)

[Multiply all grains, or fractions of a grain, by 6479 (or 648) for the metric equivalent in milligrammes.—POTTER.]

Troy Weight.	Metric.
Grains.	Grammes.
	Milligramme.
$\frac{1}{64}$	.001
$\frac{1}{40}$	.0015
$\frac{1}{30}$	.002
$\frac{1}{20}$	.003
$\frac{1}{16}$	.004
$\frac{1}{12}$	.005
$\frac{1}{10}$	.006
$\frac{1}{8}$	.008
	Centigramme
$\frac{1}{6}$	.01
$\frac{1}{4}$	.016
$\frac{1}{3}$	.02
$\frac{1}{2}$	.03
$\frac{3}{4}$	.05
1	.065
	Decigramme.
2	.13
3	.20
4	.26
5	.32
6	.39
7	.45
8	.52
9	.59
10	.65
	Gramme.
15	1.00
20 (℈j)	1.30
24	1.50
26	1.62
30 (ʒss)	1.95
40	2.60
50	3.20
60 (ʒj)	3.90
100	6.48
120 (ʒij)	7.80
180	11.65
240 (℥ss)	15.50
300	19.40
360	23.50
420	27.20
480 (℥j)	31.10
960 (℥ij)	62.20
1000	64.79

Apothecaries' Measure.	Fluid Grammes or Cubic Centimeters.		
	Liquids Lighter than Water.*	Liquids of Specific Gravity of Water.†	Liquids Heavier than Water.‡
♏ 1	.055	.06	.08
2	.10	.12	.15
3	.16	.18	.24
4	.22	.24	.32
5	.28	.30	.40
6	.32	.36	.48
7	.38	.42	.55
8	.45	.50	.65
9	.50	.55	.73
10	.55	.60	.80
12	.65	.72	.96
15	.80	.90	1.20
16	.90	1.00	1.32
20	1.12	1.25	1.60
25	1.40	1.55	2.00
30	1.70	1.90	2.50
35	2.00	2.20	2.90
40	2.25	2.50	3.30
48	2.70	3.00	4.00
50	2.80	3.12	4.15
60 (fʒj)	3.40	3.75	5.00
65	3.60	4.00	5.30
72	4.00	4.50	6.00
80	4.50	5.00	6.65
90 (fʒjss)	5.10	5.60	7.50
96	5.40	6.00	8.00
100	5.60	6.25	8.30
120 (fʒij)	6.75	7.50	10.00
150 (fʒijss)	8.50	9.50	12.50
160	9.00	10.00	13.30
180 (fʒiij)	10.10	11.25	15.00
210 (fʒiijss)	11.80	13.00	17.50
240 (fʒiv)	13.50	15.00	20.00
300 (fʒv)	16.90	18.75	25.00
330 (fʒvss)	18.60	20.75	27.50
360 (fʒvj)	20.25	22.50	30.00
420 (fʒvij)	23.60	26.25	35.00
480 (f℥j)	27.00	30.00	40.00
540 (fʒix)	30.40	33.75	45.00
600 (fʒx)	33.75	37.50	50.00
720 (fʒxij)	40.50	45.00	60.00
840 (fʒxiv)	47.25	52.50	70.00
960 (f℥ij)	54.00	60.00	80.00
1000	56.00	62.50	83.00

---

* Lighter than water are tinctures, spirits, compound spirit of ether, sweet spirit of nitre, fixed and volatile oils. Æther, f ʒ j = grammes 2.80.

† Same as water are waters, liquids, decoctions, infusions, most fluid extracts, and tinctures made with dilute alcohol.

‡ Heavier than water are syrups, glycerin, a few fluid extracts, and chloroform. Of the latter f ʒ j = grammes 5.50.

INDEX.

The salts of the metals are usually described in the text under the titles of their metallic constituents; some few (as the Arsenates, Phosphates, etc.), also the salts of the alkaloids and those of active elementary substances (as the Bromides, Iodides, etc.) are placed under the titles of their most active constituents. Salts are therefore not mentioned individually in the Index except when their places in the text are exceptional and do not come within either of the above rules.

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XXXI	3 7/8	1 15/16	1 2/7	31/32	7/11	8/17	5/16	1/4
XXXIJ	4	2	1 1/3	1	2/3	1/2	1/3	1/4
XXXIIJ	4 1/8	2 1/16	1 3/8	1 1/32	11/16	1/2	1/3	3/11
XXXIV	4 1/4	2 1/8	1 2/5	1 1/16	7/10	6/11	4/11	3/11
XXXV	4 3/8	2 3/16	1 4/9	1 1/11	5/7	5/9	4/11	2/7
XXXVI	4 1/2	2 1/4	1 1/2	1 1/8	3/4	9/16	3/8	2/7
XXXVIIJ	4 3/4	2 3/8	1 4/7	1 3/16	4/5	3/5	2/5	3/10
XXXIX	4 7/8	2 7/16	1 5/8	1 2/9	9/11	3/5	2/5	5/16
XL	5	2 1/2	1 2/3	1 1/4	5/6	5/8	5/12	5/16
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